UNITED STATES DEPARTMENT OF THE INTERIOR

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Analytical results, geochemical signatures, mineralogical data, and sample locality map of lode gold, placer gold, and heavy-mineral concentrates from the Tolovana mining district, Livengood quadrangle, Alaska

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INTRODUCTION

Geochemical studies of Alaskan gold deposits were begun in 1984 as a joint study by the U.S. Geological Survey and the State of Alaska Division of Geological and Geophysical Surveys. The objectives of the study are (1) to characterize the deposits, (2) to determine relationships of gold in placer deposits to possible lode sources, (3) to identify possible sources of gold in placer deposits, (4) to study processes of placer formation, (5) to contribute to existing knowledge of the principles of prospecting for placer deposits, and (6) to determine if minerals associated with placer deposits might suggest economic deposits of other metals. The purpose of this report is to release both the analytical data and gold signatures for lode and placer gold and also the analytical data and mineralogy of the nonmagnetic fraction of the heavy-mineral-concentrate samples from placer gold samples. Gold signatures comprise the alloy proportions and ratios of gold, silver, and copper, and the content of trace elements (Antweiler and Campbell, 1976).

SAMPLING AND ANALYTICAL PROCEDURE

Lode and placer gold samples and associated heavy-mineral concentrates from stream-sediment samples were obtained from most of the active claims in the Tolovana mining district. At some localities, miners provided us with ample amounts of gold for analysis. To determine whether differences in composition could be correlated with physical attributes, these samples were handled in various ways. Some were sieved into two or more size ranges; others were separated by color; and some were separated on the basis of physical characteristics, e.g., rounded, angular, blocky, delicate, etc. Self-explanatory, descriptive information is included in table 1. Where no descriptive information is provided, the samples were generally small, and no sorting of individual grains was attempted prior to analysis.

A total of 255 emission spectrographic analyses using a technique described by Mosier (1975) were made on lode and placer gold from 22 mines and prospects. These are the numbered sites on the sample location map (fig. 1) and correspond to the locality index (table 1). The elements analyzed and their lower limits of determination are listed on table 2. Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides, graphite, and 99.999 percent pure metallic gold. Pure Al_2O_3 was added to the standards and samples as a codistillation agent. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. Standard concentrations are based on a 5-mg gold sample weight. Because of the nature of native gold, it is often difficult to weigh exact 5-mg samples and in many instances there is less than 5-mg of gold available for analysis. Therefore, the reported concentration values (table 2) are corrected to reflect a 5-mg sample weight by the following formula:

$$\text{reported concentration value} = \text{determined value} \times \frac{5}{\text{sample weight}} .$$

The trace-element content of natural gold varies greatly from grain to grain as well as from deposit to deposit and this creates a problem in

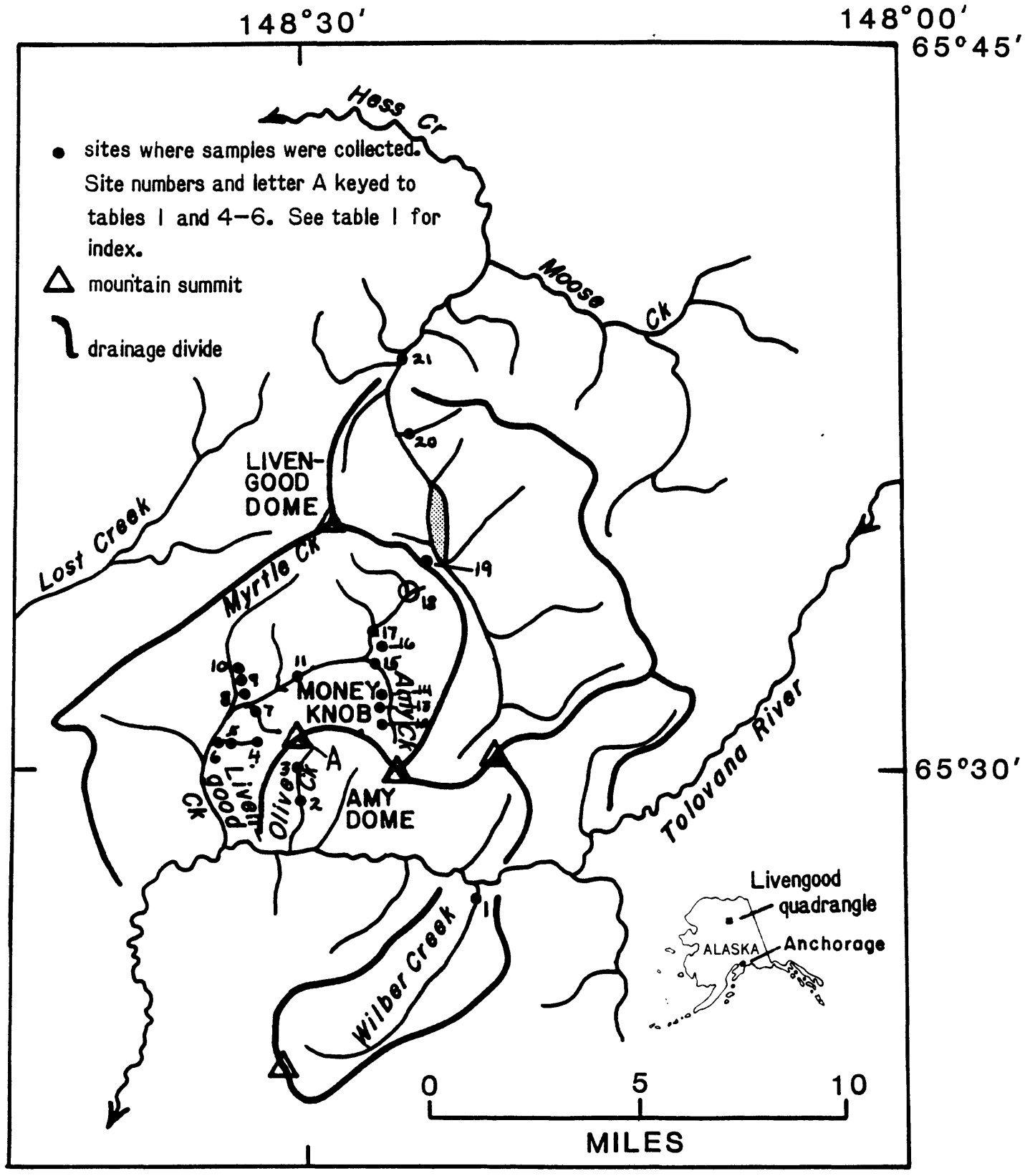

Figure 1. Localities of samples from the Tolovana mining district, Livengood quadrangle, Alaska.

determining the precision of the analytical technique. However, studies using artificial melts show that the precision of the analytical method far exceeds the natural variance of trace elements in native gold (Mosier, 1975).

Heavy-mineral-concentrate samples were obtained at most sites by wet-sieving stream sediment through a stainless-steel screen with a mesh opening of 2 mm into a 14-in steel gold pan and by panning the minus-10-mesh material. In the laboratory, the panned concentrate was air dried and sieved through a 30-mesh (0.8-mm) sieve. Since most of the rock-forming mineral grains found in stream sediment are larger than 30-mesh and the ore-mineral grains smaller than 30-mesh size, the sieving procedure greatly reduces the amount of sample that has to be further processed. The minus-30-mesh fraction was further separated using bromoform to remove the remaining minerals of a specific gravity less than 2.85. A nonmagnetic fraction of each sample was obtained using a Frantz Electromagnetic Separator with equivalent settings of 0.7 ampere and track settings of 5° forward slope and 10° side tilt. Relatively nonmagnetic fractions free of the dilutant minerals, magnetic iron oxides, garnet, amphibole, pyroxene, epidote, and other high-iron/low magnesium silicates were obtained by this procedure.

The nonmagnetic fraction of the heavy-mineral-concentrate samples were analyzed for 31 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). The elements analyzed and their lower and upper limits of determination are listed in table 3. As with the analytical method for gold, spectrographic results were obtained by visual comparison of spectra derived from sample against spectra obtained from standards made from pure oxides and carbonates with the same geometrical spacing of concentrations. The precision of the analytical method for the nonmagnetic fraction is approximately plus or minus one reporting interval at the 83 percent confidence level and plus or minus two reporting intervals at the 96 percent confidence level (Motooka and Grimes, 1976).

The nonmagnetic heavy-mineral fraction was scanned visually using a binocular microscope and shortwave ultraviolet light to identify ore-related minerals. In most cases, the mineral grains could be identified from their physical properties, but x-ray diffraction was used to confirm some species. This visual examination is an important supplement to the spectrographic analyses because the particulate nature of this sample medium poses problems for both the sample preparer and the analyst. A 5-mg split of finely pulverized sample is normally used for the spectrographic analysis, however malleable minerals such as gold, silver, and copper may be poorly represented in the sample because of smearing out on the pulverizer components. Another benefit of the visual examination is identifying artifacts such as bullet and solder fragments, wire, or other man-made contaminants. It is useful to be aware of these contaminants as they can give inflated values of the ore-related elements in the spectrographic results.

RELIABILITY OF GOLD ANALYSES

Differences in the composition of native gold from different geological settings can readily be distinguished using the analytical procedures mentioned above if enough analyses are made to ascertain the magnitude of natural variations in gold samples. In this study five or more spectrographic analyses were found desirable for a single sample site to obtain a signature in which one can place confidence. However, in the context of many other analyses from this district, a single analysis is of value.

The composition of native gold varies considerably (for example, see Gay, 1963; Jones and Fleischer, 1969). Variations in composition are present even from point to point within the same grain (Desborough, 1970). Native gold in oxidized zones and in associated placers generally contains lesser amounts of silver and other elements compared with the native gold in the corresponding primary deposits; within some specific deposits, single particles of native gold are relatively homogeneous, but in other deposits the native gold is heterogeneous (Boyle, 1979). Because variations in gold composition are natural rather than analytical, they are worthy of study, particularly so their significance can be understood. In spite of the variations, gold compositional data are useful in that they help characterize conditions of ore deposition and are commonly locally distinctive for mines, districts, or regions. Moreover, they are useful in determining the relationships of gold in placer deposits to possible lode sources, and in meeting the other objectives stated in the introductory section of this report.

The natural variability of analyses for Ag and Cu in gold from a single locality was determined by repeatedly analyzing portions of single nuggets (Mosier, 1975; Antweiler and Campbell, 1987). They found silver content of one such nugget ranged from 4.7 to 8.1 percent in four analyses with a standard deviation (S.D.) of ±1.6 percent and the copper content of this nugget ranged from .048 to .08 percent with a standard deviation of ±.0144 percent. Replicate analyses of portions of another nugget from the same locality showed silver content of 18.9 to 19.8 percent with a standard deviation of ±0.56 percent and copper content .038 to .055 percent with a standard deviation of ±.012 percent. Such analytical results indicated considerable natural variability. Another nugget from the same locality was washed with hydrofluoric acid to remove surface coatings, then heated to 1300 °C for 30 minutes to homogenize silver and copper content. Analysis of ten 5-mg portions of that nugget each time showed excellent precision; 10 percent silver, (S.D.=0) and 0.05 percent copper (S.D.=0). Prior to acid washing and heat treating, ten 5-mg portions ranged in silver content from 1.5 to 15 percent and in copper content from .015 to .05 percent indicating their natural variation (Mosier, 1975). The concentration of other elements in nuggets from the locality ranged somewhat more widely than copper and silver, even after the homogenization treatment. Significantly, however, the mean values for most elements, including copper and silver, were almost the same on 10 analyses of the natural sample as the mean values for those elements on the homogenized sample, except for elements removed by the acid and heat treatment.

Accuracy is much more difficult to determine than precision because homogeneous gold samples with known amounts of impurities are not readily available. However, standards prepared with known amounts of copper and silver show the method to be accurate within a factor of two in determination of those elements (Mosier, 1975).

One test for reliability of the method is comparison of fineness on samples from localities where large lots of gold have been analyzed for the U.S. Mint or by banks or commercial refiners who have purchased gold. Compilations of gold fineness data have been made by Smith (1941) and by Metz and Hawkins (1981). Also, the First National Bank in Fairbanks made available to us records of gold purchases from 1903 to 1937 from many Alaskan placer deposits. These compilations show excellent agreement for some areas with each other, and poor agreement in other areas. The U.S. Geological Survey data, although acquired by analyses of relatively small samples, agree as well as the data from those sources and are therefore reliable to the extent permitted by natural variation of gold composition.

DESCRIPTION OF DATA TABLES

The analytical results for lode and placer gold (table 4) are given in weight percent and are presented by site numbers/letters which are keyed to table 1. The USGS-assigned sample number is given under sample. When sufficient gold was available from a particular site, multiple analyses were made and the results are listed. For this study, fineness is defined as:

$$\text{fineness} = \frac{\text{Au wt\%}}{\text{Au wt\%} + \text{Ag wt\%}} \times 1{,}000 \ .$$

The gold value was determined by difference, that is:

$$\text{Au\%} = 100\text{-}(\text{Ag\%} + \text{X\%}),$$

where X% is the sum of elements other than gold and silver. If an element was not detected at the lower limit of detection, a -- was entered. The actual weight in milligrams of the gold sample analyzed is given under wt. The values under r = Au/Ag, Au/Cu, Ag/Cu, and r/Cu are self-explanatory alloy ratios that are part of the gold signature (Antweiler and Campbell, 1976). Because the corrected values shown in table 4 are computer-generated data, these results often carry more digits than are significant. The analysts did not determine these values to the accuracy suggested by the extra numbers.

Table 5 lists the results of the analyses for the nonmagnetic fraction of the heavy-mineral-concentrate samples and are presented by localities. No analytical data on heavy-mineral concentrates were obtained from sites 8, 9, 14, 15, and 18. Values determined for the major elements (iron, magnesium, calcium, and titanium) are given in weight percent; all others are given in parts per million (micrograms/gram). The USGS-assigned sample number corresponds to the placer and lode gold sample number.

Table 6 shows the mineralogical results of the nonmagnetic heavy-mineral-concentrate samples. No mineralogical data were obtained from sites 8, 9, 14, 15, and 18. The percentages determined for the pyrite and scheelite are visual estimates as seen in the microscope field under 20X magnification and do not reflect actual grain counts. If a mineral species was observed in the sample and determined to be less than 1% by volume of the total nonmagnetic sample, an "X" is used. This table indicates only those minerals that we believe may be ore-related and does not show extraneous minerals such as apatite, sphene, zircon, etc., most of which appeared in all samples.

OTHER PUBLICATIONS

Other U.S. Geological Survey publications showing principally analytical results, geochemical signatures, mineralogical data, and sample locality maps of placer/lode gold and heavy-mineral concentrates from other gold mining districts in Alaska are:

1. Mosier, E.L., and Lewis, J.S., 1986, Analytical results, geochemical signatures, and sample locality map of lode gold, placer gold, and heavy-mineral concentrates from the Koykuk-Chandalar mining district, Alaska: U.S. Geological Survey Open-File Report 86-345, 172 p., 1 pl.
2. Cathrall, J.B., Antweiler, J.C., and Mosier, E.L., 1987, Occurrence of platinum in gold samples from the Tolovana and Rampart mining districts, Levengood quadrangle, Alaska: U.S. Geological Survey Open-File Report 87-330, 12 pages, 1 pl.

3. McDanal, S.K., Cathrall, J.B., Mosier, E.L., Antweiler, J.C., and Tripp, R.B., 1988, Analytical results, geochemical signatures, mineralogical data, and sample locality map of placer gold and heavy-mineral concentrates from the Manlay Hot Springs, Tofty, Eureka, and Rampart mining districts, Tanana and Livengood quadrangles, Alaska: U.S. Geological Survey Open-File Report 88-443, 54 p.

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Metz, Paul A., and Hawkins, D.B., 1981, A summary of gold fineness values for Alaska Placer deposits: School of Mineral Industry, University of Alaska, Fairbanks, Alaska 99701, MIRL Report 45.

Mosier, E.L., 1975, Use of emission spectroscopy for the semiquantitative analysis of trace elements and silver in native gold, in F.N. Ward, ed., New and refined methods of trace analysis useful in geochemical exploration: U.S. Geological Survey Bulletin 1408, p. 97-105.

Motooka, J.M., and Grimes, D.J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.

Smith, P.S., 1941, Fineness of gold from Alaska placers: U.S. Geological Survey Bulletin 910-C, p. 147-272.

TABLE 1.--Index for site, type of gold, locality name, and gold description for lode and placer gold samples from the Tolovana mining district, Livengood quadrangle, Alaska

[A, lode gold site; 1-21, placer gold site]

Site type	Locality name	Gold description
A.01	Old Smokey Prospect	Minus 100-mesh gold
A.02	--Do----------	Plus 20-mesh gold
1.01	Wilber Creek	Minus 60-, plus 100-mesh gold
1.02	--Do--------	Plus 20-mesh gold
1.03	--Do--------	Minus 60-, plus 100-mesh gold
1.04	--Do--------	Minus 100-mesh gold
2.01	Oliver Creek, middle	Minus 20-mesh gold
2.02	--Do----------	Plus 20-mesh gold
2.03	--Do----------	Gold with intergrown oxides
2.04	--Do----------	Minus 20-, plus 60-mesh gold
2.05	--Do----------	Plus 20-mesh gold; smooth flat
3.01	Oliver Creek, upper	Minus 20-, plus 60-mesh gold
3.02	--Do----------	Plus 20-mesh gold
3.03	--Do----------	Minus 20-, plus 100-mesh gold
3.04	--Do----------	Minus 100-, plus 160-mesh gold
3.05	--Do----------	Unsorted gold
4.01	Lillian Creek, upper	Angular, blocky grains of gold
4.02	--Do----------	Rounded, spherical grains of gold
4.03	--Do----------	Crystalline, bright yellow grains of gold
4.04	--Do----------	Unsorted gold
4.05	--Do----------	Unsorted gold and amalgam
4.06	--Do----------	Amalgamated gold after nitric acid leach
5.01	Lillian Creek, middle	Amalgamated gold after nitric acid leach
5.02	--Do----------	Plus 100-mesh gold
5.03	--Do----------	Unsorted gold
6.01	Lillian Creek, lower	Minus 20-, plus 60-mesh gold; worn blocky grains
6.02	--Do----------	Minus 20-, plus 60-mesh gold; crystals
6.03	--Do----------	Minus 20-, plus 60-mesh gold; not worn
6.04	--Do----------	Minus 20-, plus 60-mesh gold; spheroids
6.05	--Do----------	Minus 20-, plus 60-mesh gold; flattened wires
6.06	--Do----------	Minus 60-, plus 100-mesh gold; angular
6.07	--Do----------	Minus 60-, plus 100-mesh gold; spheroids
6.08	--Do----------	Minus 60-, plus 100-mesh gold; wires
6.09	--Do----------	Minus 60-, plus 100-mesh gold; worn grains
7.01	Ruth Creek	Minus 20-, plus 60-mesh gold; rounded with quartz inclusions
7.02	--Do------	Minus 20-, plus 60-mesh gold; flat flakes
7.03	--Do------	Minus 20-, plus 60-mesh gold; crystals
7.04	--Do------	Minus 20-, plus 60-mesh gold; delicate forms
7.05	--Do------	Minus 20-, plus 60-mesh gold; unsorted
7.06	--Do------	Minus 60-, plus 100-mesh gold
7.07	--Do------	Minus 100-, plus 160-mesh gold
7.08	--Do------	Minus 160-mesh gold

TABLE 1.--continued

7.09	--Do------	Minus 20-, plus 60-mesh gold; spheres flattened
7.10	--Do------	Minus 20-, plus 60-mesh gold; perfect spheres
7.11	--Do------	Plus 20-mesh gold; hopper-type crystals
7.12	--Do------	Minus 20-, plus 60-mesh gold; stained
7.13	--Do------	Minus 60-, plus 100-mesh gold; flattened wires
7.14	--Do------	Minus 100-mesh gold; wires and thin flakes
7.15	--Do------	Minus 100-mesh gold; flat thin flakes
7.16	--Do------	Unsorted dirty gold; many impurities
7.17	--Do------	Gold with amalgam
8.01	Between Livengood and Myrtie Creek junction (83-86[1])	Unsorted gold
9.01	--Do----------(83-38[1])	Unsorted gold
10.01	Pit between Livengood and Myrtie Creek junction	Unsorted gold
11.01	Livengood Creek, above Gertrude Creek	Minus 20-, plus 60-mesh gold
11.02	--Do----------	Plus 20-mesh gold; worn, flat, red-tinted flakes
11.03	--Do----------	Plus 20-mesh gold; worn, flat, green stained
11.04	--Do----------	Plus 20-mesh gold; green-tinted flakes
11.05	--Do----------	Plus 20-mesh gold; little worn crinkly flakes
12.01	Fannie Gulch, I	Crinkly, delicate gold flakes
12.02	--Do----------	Minus 20-, plus 60-mesh gold
12.03	--Do----------	Plus 20-mesh gold
12.04	--Do----------	Minus 60-, plus 100-mesh gold
12.05	--Do----------	Minus 100-, plus 160-mesh gold
12.06	--Do----------	Minus 160-mesh gold
13.01	Fannie Gulch, II	Minus 20-, plus 60-mesh gold
13.02	--Do----------	Plus 20-mesh gold; flat
13.03	--Do----------	Plus 20-mesh gold; delicate crinkly grains
13.04	--Do----------	Minus 60-, plus 100-mesh gold
13.05	--Do----------	Minus 100-, plus 160-mesh gold
13.06	--Do----------	Unsorted gold
14.01	Amy Creek, bench, left limit	Unsorted gold
15.01	Amy Creek, I	Minus 20-mesh gold; angular, little worn
15.02	--Do--------	Plus 20-mesh gold
16.01	Amy Creek, II	Minus 20-, plus 60-mesh gold; amalgam
16.02	--Do---------	Minus 20-, plus 100-mesh gold
16.03	--Do---------	Minus 20-, plus 100-mesh gold; flat grains
16.04	--Do---------	Minus 20-, plus 60-mesh gold; rounded grains
16.05	--Do---------	Minus 60-, plus 160-mesh gold; reddish stain
16.06	--Do---------	Minus 60-, plus 160-mesh gold; bright yellow

TABLE 1.--continued

17.01	Livengood Creek, above Amy Creek	Unsorted gold
18.01	Livengood-Heine Creek Area (81, 26, 41-51[1])	Unsorted gold
18.02	Livengood-Heine Creek Area (82, 26, 51-61[1])	Unsorted gold
18.03	Livengood Heine Creek Area (80, 28, 58-68[1])	Unsorted gold
18.04	Livengood Heine Creek Area (82, 30, 48-56[1])	Unsorted gold
18.05	Livengood Heine Creek Area (81, 30, 59-69[1])	Unsorted gold
18.06	Livengood Heine Creek Area (83, 31, 45-55[1])	Unsorted gold
18.07	Livengood Heine Creek Area (83, 32, 45-55[1])	Unsorted gold
19.01	North of Heine Creek, south of reservoir	Minus 20-, plus 60-mesh gold; angular and blocky
19.02	-----Do----------	Minus 20-, plus 60-mesh gold
19.03	-----Do----------	Minus 60-, plus 160-mesh gold
20.01	Discovery Pup	Unsorted gold
21.01	Hess Creek, below Willow Creek	Unsorted gold

[1]Field number

TABLE 2.--Lower limits of determination for the spectrographic analysis of gold, based on a 5-mg sample

Elements	Lower determination limit
	Percent
Silver (Ag)	0.001
Copper (Cu)	.0005
Zinc (Zn)	.005
Gallium (Ga)	.0002
Lead (Pb)	.0002
Arsenic (As)	.005
Antimony (Sb)	.002
Cadmium (Cd)	.0002
Bismuth (Bi)	.0002
Indium (In)	.0005
Mercury (Hg)	.002
Tellurium (Te)	.005
Nickel (Ni)	.0005
Cobalt (Co)	.0005
Tin (Sn)	.0005
Molybdenum (Mo)	.0005
Germanium (Ge)	.0005
Platinum (Pt)	.001
Palladium (Pd)	.0002
Barium (Ba)	.0005
Strontium (Sr)	.01
Zirconium (Zr)	.0005
Vanadium (V)	.001
Chromium (Cr)	.001
Yttrium (Y)	.0005
Lanthanum (La)	.002
Scandium (Sc)	.0005
Niobium (Nb)	.001
Boron (B)	.0005
Tantalumm (Ta)	.005
Beryllium (Be)	.0001
Tungsten (W)	.005
Manganese (Mn)	.0001
Iron (Fe)	.001
Magnesium (Mg)	.0005
Calcium (Ca)	.001
Titanium (Ti)	.001
Silicon (Si)	.0002

TABLE 3.--Limits of determination for the spectrographic analysis of heavy-mineral concentrates, based on a 5-mg sample

Elements	Lower determination limit	Upper determination limit
	Percent	
Iron (Fe)	0.1	50
Magnesium (Mg)	.05	20
Calcium (Ca)	.1	50
Titanium (Ti)	.005	2
	Parts per million	
Manganese (Mn)	20	10,000
Silver (Ag)	1	10,000
Arsenic (As)	500	20,000
Gold (Au)	20	1,000
Boron (B)	20	5,000
Barium (Ba)	50	10,000
Beryllium (Be)	2	2,000
Bismuth (Bi)	20	2,000
Cadmium (Cd)	50	1,000
Cobalt (Co)	10	5,000
Chromium (Cr)	20	10,000
Copper (Cu)	10	50,000
Lanthanum (La)	50	2,000
Molybdenum (Mo)	10	5,000
Niobium (Nb)	50	5,000
Nickel (Ni)	10	10,000
Lead (Pb)	20	50,000
Antimony (Sb)	200	20,000
Scandium (Sc)	10	200
Tin (Sn)	20	2,000
Strontium (Sr)	200	10,000
Vanadium (V)	20	20,000
Tungsten (W)	100	20,000
Yttrium (Y)	20	5,000
Zinc (Zn)	500	20,000
Zirconium (Zr)	20	2,000
Thorium (Th)	200	5,000

TABLE 4.--Signatures of lode and placer gold from the Tolovana mining district, Livengood quadrangle, Alaska

[Fine = fineness where $\frac{Au\%}{Au\% + Ag\%} \times 1{,}000$; x = sum of elements other than gold and silver; wt = sample weight in milligrams; all element and X values are given in percent; Ga, In, Te, and Ta analyzed, but not detected; --, not detected. See table 1 for locality name and gold description which corresponds with site locality and analysis.]

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3225A	A.01	87.4	895	10.3	2.2919	.0103	--	.0021	.1029	--	--	--	.3086	.0103	--	--
3225B	A.01	87.9	903	9.4	2.6714	.0094	--	.0014	.1883	--	--	--	.4708	.0094	.0005	--
3225C	A.01	86.3	896	10.0	3.7499	.0070	--	.0030	.1000	--	--	--	.2000	.0100	.0005	.0010
3225D	A.01	86.7	897	10.0	3.2859	.0070	--	.0015	.1500	--	--	--	.2000	.0150	.0005	.0005
3225XA	A.02	85.9	899	9.6	4.4492	.0067	--	.0048	.1923	--	--	.0019	.1923	.0029	--	--
3225XB	A.02	85.1	895	10.0	4.9220	.0050	--	.0015	.2000	--	--	--	.5000	.0050	--	--
3225XC	A.02	84.9	900	9.4	5.6628	.0094	--	.0019	.4717	--	--	--	.1887	.0066	--	--
3225XD	A.02	83.4	893	10.0	6.5943	.0070	--	.0020	.3000	--	--	--	.5000	.0100	.0007	--
3231A	1.01	83.6	848	15.0	1.3521	.0200	--	.0050	--	.0020	--	--	1.0000	--	--	--
3231B	1.01	83.7	848	15.0	1.3279	.0300	--	.0070	--	.0020	--	--	1.0000	--	--	--
3231C	1.01	84.5	853	14.6	.9253	.0291	--	.0019	--	--	--	--	.4854	.0019	--	--
3231XA	1.02	81.6	829	16.9	1.5425	.0169	--	.0225	--	--	--	.0006	.0562	.0056	--	--
3231XB	1.02	82.7	837	16.1	1.1486	.0538	--	.0538	--	--	--	--	.5376	.0022	--	--
3231XC	1.02	84.5	852	14.6	.8880	.0146	--	.0195	--	--	--	.0002	.4883	.0020	--	--
3231RA	1.03	83.1	841	15.8	1.1091	.0525	--	.0210	--	.0021	--	.0158	.5252	.0053	--	--
3231RB	1.03	83.6	848	15.0	1.4242	.0500	--	.0300	--	.0020	--	.0050	1.0000	--	--	--
3231RC	1.03	83.7	848	15.0	1.3327	.0500	--	.0100	--	.0030	--	.0015	1.0000	--	--	--
3231SA	1.04	80.7	830	16.6	2.7743	.0773	--	.0110	--	.0033	--	.0077	2.2075	.0017	--	--
3224A	2.01	89.4	901	9.8	.7538	.0490	--	.0002	.0039	--	--	--	.4902	.0029	--	--
3224B	2.01	89.1	902	9.7	1.2012	.0485	--	.0002	.0097	.0019	--	--	.9709	.0097	.0005	--
3224C	2.01	88.8	899	10.0	1.2467	.0300	--	.0010	.0050	.0018	--	--	1.0000	.0050	--	--
3224XA	2.02	92.5	934	6.5	1.0664	.0185	--	.0006	--	--	--	--	.2778	.0028	--	--
3224XB	2.02	89.3	902	9.7	.9581	.0097	--	.0005	--	--	--	--	.4873	.0005	--	--
3224XC	2.02	88.5	898	10.0	1.5389	.0150	--	.0007	--	--	--	--	1.0000	.0010	--	--
3224MA	2.03	93.5	963	3.6	2.9120	.0267	.0356	.0036	.0125	.0036	--	.0012	.0890	.0178	.0018	--
3286A	2.04	82.4	853	14.2	3.4567	.0142	--	.0708	.0057	.0283	--	.0425	.0992	.0071	--	.2833
3286B	2.04	86.5	901	9.5	3.9312	.0272	--	.0027	.0095	--	--	--	2.7248	.0068	--	.0409
3286MA	2.05	88.7	890	11.0	.2381	.0771	--	.0017	--	--	--	--	.1101	--	--	.0017
3286MB	2.05	90.1	903	9.7	.2621	.0483	--	.0019	--	--	--	.0005	.0965	--	--	.0019
3221A	3.01	90.1	911	8.8	1.1473	.0263	--	.0061	.0044	.0015	--	--	.8772	--	--	--
3221B	3.01	88.2	900	9.8	2.0382	.0489	--	.0005	.0039	--	--	--	.9785	.0020	--	--
3221C	3.01	88.9	899	10.0	1.0559	.0300	--	.0005	.0040	--	--	--	.2000	.0010	--	--
3221XA	3.02	89.2	911	8.8	2.0355	.0438	.0175	.0009	.0061	--	--	--	.4378	.0131	.0018	--
3221XB	3.02	88.2	898	10.0	1.7562	.0200	.0050	.0007	.0040	--	--	--	.5000	.0020	--	--
3221XC	3.02	89.6	906	9.3	1.1092	.0186	.0139	.0046	.0093	--	--	--	.0928	.0093	.0006	--
3221RA	3.03	89.2	904	9.4	1.3342	.0283	--	.0094	.0047	.0017	--	--	.9434	.0047	--	--
3221RB	3.03	88.3	898	10.0	1.6814	.0500	--	.5000	.0100	.0050	--	.0005	.7000	.0070	--	--
3221RC	3.03	88.1	898	10.0	1.9497	.0200	--	.0070	.1000	.0020	--	--	1.5000	.0005	.0005	--
3221SA	3.04	89.2	927	7.0	3.7577	.0150	--	.5000	.0048	--	--	.0030	3.0000	.0010	--	.0020
3221SB	3.04	87.1	901	9.6	3.3310	.0481	--	.0192	.0067	.0017	--	--	2.8846	.0067	.0005	.0048
3221SC	3.04	85.9	896	10.0	4.1414	.0500	--	.5000	.1000	.0018	--	.0002	3.0000	.0050	--	.0050
3222	3.05	82.7	853	14.3	3.0286	.0238	--	.0071	--	--	--	--	2.3810	--	--	--
3223A	3.05	82.8	847	15.0	2.1572	.0200	--	.0100	--	.0050	--	--	2.0000	.0007	--	--
3223B	3.05	89.8	906	9.4	.7952	.0281	--	.0002	--	--	--	--	.4682	.0007	--	--
3223C	3.05	94.5	953	4.6	.8785	.0278	--	.0003	.0037	--	--	--	.4630	.0019	--	--
3223D	3.05	92.4	936	6.4	1.2230	.0455	--	.0003	.0045	--	--	--	.1818	.0045	--	--
3257A	4.01	89.8	928	7.0	3.1979	.0500	--	.0003	--	.0050	--	--	3.0000	.0020	--	--
3257B	4.01	92.9	931	6.8	.2817	.0146	--	.0049	.0293	--	--	--	.1953	--	--	--
3257SA	4.02	92.0	929	7.0	1.0294	.0700	--	.0002	--	--	--	--	.7000	.0005	--	--
3257SB	4.02	85.0	868	13.0	2.0466	.0926	--	.0278	.0093	--	--	--	1.2963	.0056	.0009	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	B
3225A	A.01	--	--	--	--	.0021	--	--	.0010	.0015	.0103	.2058	--	--	.0001
3225B	A.01	--	--	--	--	.0094	--	.0066	.0009	.0019	.0471	.4708	--	--	.0002
3225C	A.01	--	--	--	--	.0500	--	.0010	.0050	.0300	.0500	1.0000	--	--	.0003
3225D	A.01	--	--	--	--	.0100	--	.0100	.0050	.0100	.1000	1.0000	--	--	.0003
3225XA	A.02	--	--	--	--	.0029	.0096	.0007	.0010	.0019	.0014	.0048	--	--	--
3225XB	A.02	--	.0010	--	--	.0300	.0200	.0005	.0010	.0020	--	--	--	--	.0010
3225XC	A.02	--	--	--	--	.0189	.0189	.0009	.0014	.0028	--	.0019	--	--	.0009
3225XD	A.02	--	--	.0200	--	.0100	.0100	.0020	.0030	.1500	.0020	.0200	--	--	.0005
3231A	1.01	--	--	--	--	--	--	--	--	--	--	--	--	--	.0002
3231B	1.01	--	--	--	--	--	--	--	--	--	--	--	--	--	.0002
3231C	1.01	--	--	--	--	--	--	--	--	--	--	--	--	--	.0001
3231XA	1.02	--	--	--	--	.0022	--	--	.0011	.0011	--	--	--	--	.0003
3231XB	1.02	--	--	--	--	--	--	--	--	--	--	--	--	--	.0002
3231XC	1.02	--	--	--	--	--	--	--	--	--	--	--	--	--	.0001
3231RA	1.03	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3231RB	1.03	--	--	--	--	--	--	--	--	--	--	--	--	--	.0002
3231RC	1.03	--	--	--	--	--	--	--	--	--	--	--	--	--	.0002
3231SA	1.04	--	--	.1104	.0033	--	--	--	--	--	--	--	--	--	.0002
3224A	2.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3224B	2.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3224C	2.01	--	--	--	--	--	--	--	--	.0100	--	--	--	--	--
3224XA	2.02	--	--	--	--	.0006	--	--	--	.0008	--	--	--	--	.0009
3224XB	2.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3224XC	2.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3224MA	2.03	--	--	--	--	--	--	--	.0015	.0036	--	--	--	--	--
3286A	2.04	--	--	--	--	.0028	--	.0006	--	.0014	--	--	--	--	--
3286B	2.04	--	--	--	--	--	--	--	.0020	.0014	--	--	--	--	--
3286NA	2.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3286NB	2.05	--	--	--	--	--	--	--	--	.0097	--	--	--	--	--
3221A	3.01	--	--	--	--	.0009	--	--	--	.0007	--	--	--	--	--
3221B	3.01	--	--	--	--	.0010	--	--	--	.0008	--	--	--	--	.0002
3221C	3.01	--	--	--	--	.0005	--	--	--	.0009	--	--	--	--	--
3221XA	3.02	--	--	--	--	.0006	--	--	--	.0007	--	--	--	--	--
3221XB	3.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3221XC	3.02	--	--	--	--	.0009	--	--	--	.0009	--	--	--	--	--
3221RA	3.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3221RB	3.03	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3221RC	3.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3221SA	3.04	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3221SB	3.04	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3221SC	3.04	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3222	3.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3223A	3.05	--	--	--	--	.0150	--	--	--	--	--	--	--	--	--
3223B	3.05	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3223C	3.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3223D	3.05	--	--	--	--	.0014	--	--	.0009	.0008	--	--	--	--	.0001
3257A	4.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3257B	4.01	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3257SA	4.02	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3257SB	4.02	--	--	.2778	.0037	.0009	--	--	--	--	--	--	--	--	--

Tolovana Data--Continued

Sample	Site	Be	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3225A	A.01	.0001	--	.0010	1.0288	.0309	.0103	.0514	.5144	4.86	8.5	8,497	1,000	826
3225B	A.01	.0001	.0038	.0007	.6591	.0282	.0094	.0942	.6591	5.31	9.3	9,336	1,000	992
3225C	A.01	.0001	.0070	.0050	1.0000	.0500	.0300	.7000	.5000	5.00	8.6	12,321	1,429	1,232
3225D	A.01	.0001	.0040	.0020	.7000	.0500	.0200	.5000	.5000	5.00	8.7	12,388	1,429	1,239
3225XA	A.02	--	--	.0019	1.9231	.0962	.0144	.0673	1.9231	5.20	8.9	12,768	1,429	1,328
3225XB	A.02	--	--	.0050	2.0000	.0700	.0300	.0500	2.0000	5.00	8.5	17,016	2,000	1,702
3225XC	A.02	.0001	.0094	.0047	2.8302	.0943	.0472	.0660	1.8868	5.30	9.0	9,000	1,000	954
3225XD	A.02	.0001	--	.0070	3.0000	.1500	.2000	.2000	2.0000	5.00	8.3	11,915	1,429	1,192
3231A	1.01	--	--	.0010	.1000	.0200	.0030	.0010	.2000	5.00	5.6	4,182	750	279
3231B	1.01	--	--	.0007	.0700	.0150	.0020	.0010	.2000	5.00	5.6	2,789	500	186
3231C	1.01	--	--	.0010	.1942	.0097	.0029	.0049	.1942	5.15	5.8	2,902	500	199
3231XA	1.02	--	--	.0034	.5618	.0562	.0112	.0169	.7865	4.45	4.8	4,842	1,000	287
3231XB	1.02	--	--	.0016	.3226	.0108	.0032	.0016	.1613	4.65	5.1	1,539	300	95
3231XC	1.02	--	--	.0020	.1953	.0146	.0020	.0029	.1465	5.12	5.8	5,766	1,000	394
3231RA	1.03	--	.0105	.0315	.3151	.0158	.0053	.0032	.1050	4.76	5.3	1,583	300	100
3231RB	1.03	--	--	.0150	.1500	.0150	.0020	.0050	.1500	5.00	5.6	1,672	300	111
3231RC	1.03	--	--	.0010	.1000	.0100	.0050	.0020	.1500	5.00	5.6	1,673	300	112
3231SA	1.04	--	.0055	.0011	.2208	.0110	.0022	.0009	.1104	4.53	4.9	1,044	214	63
3224A	2.01	--	--	.0007	.0980	.0069	.0020	.0020	.0980	5.10	9.1	1,825	200	186
3224B	2.01	--	--	.0005	.0485	.0097	.0019	.0019	.0971	5.15	9.2	1,835	200	189
3224C	2.01	--	--	.0010	.0700	.0200	.0020	.0010	.1000	5.00	8.9	2,958	333	296
3224XA	2.02	--	--	.0009	.2778	.0185	.0014	.0028	.4630	5.40	14.3	4,992	350	770
3224XB	2.02	--	--	.0005	.1462	.0146	.0010	.0049	.2924	5.13	9.2	9,162	1,000	940
3224XC	2.02	--	--	.0007	.2000	.0150	.0010	.0050	.3000	5.00	8.8	5,897	667	590
3224MA	2.03	--	--	.0089	1.7794	.0356	.0018	--	.8897	2.81	26.3	3,504	133	985
3286A	2.04	--	--	.0071	1.4164	.0283	.0042	.0283	1.4164	3.53	5.8	5,816	1,000	411
3286B	2.04	--	--	.0027	.6812	.0136	.0027	.0068	.4087	3.67	9.1	3,176	350	333
3286NA	2.05	--	--	.0002	.0220	.0022	.0011	--	.0220	4.54	8.1	1,151	143	105
3286NB	2.05	--	--	.0005	.0483	.0048	.0014	--	.0483	5.18	9.3	1,867	200	193
3221A	3.01	--	--	.0003	.0877	.0088	.0018	--	.1316	5.70	10.3	3,423	333	390
3221B	3.01	--	--	.0010	.2935	.0196	.0020	.0015	.6849	5.11	9.0	1,802	200	184
3221C	3.01	--	--	.0020	.3000	.0150	.0010	.0010	.5000	5.00	8.9	2,965	333	296
3221XA	3.02	--	--	.0026	.8757	.0175	.0018	.0026	.6130	5.71	10.2	2,038	200	233
3221XB	3.02	--	--	.0010	.2000	.0200	.0030	--	1.0000	5.00	8.8	4,412	500	441
3221XC	3.02	--	--	.0028	.6494	.0186	.0046	.0046	.2783	5.39	9.7	4,830	500	521
3221RA	3.03	--	--	.0009	.1887	.0066	.0028	.0009	.1415	5.30	9.5	3,153	333	334
3221RB	3.03	--	--	.0007	.3000	.0050	.0020	.0009	.1000	5.00	8.8	1,766	200	177
3221RC	3.03	--	--	.0007	.3000	.0050	.0020	.0015	.0100	5.00	8.8	4,403	500	440
3221SA	3.04	--	--	.0007	.0700	.0070	.0015	.0030	.1500	5.00	12.7	5,949	467	850
3221SB	3.04	--	--	.0014	.1923	.0096	.0010	.0096	.1442	5.20	9.1	1,811	200	188
3221SC	3.04	--	--	.0020	.3000	.0100	.0150	.0020	.1500	5.00	8.6	1,717	200	172
3222	3.05	--	--	.0024	.2381	.0143	.0048	.0238	.3333	1.05	5.8	3,473	600	243
3223A	3.05	--	--	.0005	.0500	.0050	.0010	--	.0500	5.00	5.5	4,142	750	276
3223B	3.05	--	--	.0007	.0936	.0140	.0019	--	.1873	5.34	9.6	3,198	333	342
3223C	3.05	--	--	.0009	.2778	.0093	.0014	--	.0926	5.40	20.4	3,402	167	735
3223D	3.05	--	--	.0014	.4545	.0182	.0091	.0455	.4545	5.50	14.5	2,033	140	319
3257A	4.01	--	--	.0001	.0200	.0150	.0050	--	.1000	5.00	12.8	1,796	140	257
3257B	4.01	--	--	.0001	.0146	.0010	.0020	--	.0195	5.12	13.6	6,341	467	928
3257SA	4.02	--	--	.0003	.1000	.0050	.0030	--	.1500	5.00	13.1	1,314	100	188
3257SB	4.02	--	--	.0003	.1296	.0093	.0056	.0019	.1852	2.70	6.6	918	140	71

Tolovana Data--Continued

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3257VA	4.03	90.7	930	6.9	2.4527	.0275	--	.0003	.2060	--	--	--	1.3736	.0014	--	--
3257VB	4.03	80.7	871	11.9	7.3699	.0238	--	.0005	--	--	--	--	7.1429	--	--	--
3217A	4.04	84.8	894	10.0	5.2397	.0300	--	.0500	.0100	.0030	--	--	5.0000	--	--	--
3217B	4.04	79.3	816	17.9	2.8807	.0238	--	.0357	.0060	.0060	--	--	.5952	.0008	--	--
3217C	4.04	88.4	902	9.6	2.0208	.0192	--	.0192	.0067	.0048	--	--	.4808	.0010	--	--
3217D	4.04	88.2	899	9.9	1.8766	.0198	--	.0198	.0050	.0050	--	--	.4950	.0007	--	--
3217MA	4.05	89.5	913	8.5	1.9680	.0598	--	.0043	.0060	.0043	--	--	.8547	.0043	--	.0026
3217MB	4.05	90.4	909	9.0	.5961	.0181	--	.0009	.0181	.0018	--	--	.0904	.0014	--	.0005
3217MC	4.05	90.0	926	7.1	2.8772	.0306	--	.0020	.0510	.0051	--	--	2.0408	.0204	.0020	.0020
3217MD	4.05	89.5	900	10.0	.4634	.1000	--	.0015	--	.0050	--	--	.0500	.0010	--	.0005
3218A	4.06	86.9	925	7.0	6.1046	.0700	.0500	.2000	.0100	.1500	--	.0020	3.0000	.0070	--	.5000
3218D	4.06	90.1	947	5.0	4.9407	.0700	.1000	.3000	.0300	.3000	--	.0070	3.0000	.0070	--	.5000
3219MA	5.01	86.7	925	7.0	6.3415	.0200	.0050	.0050	.0500	--	--	--	6.0000	.0050	--	--
3219MB	5.01	88.0	946	5.0	7.0213	.0700	.0200	.0070	.2000	.0020	--	.0003	6.0000	--	--	.0015
3219MC	5.01	88.7	947	5.0	6.3482	.0300	.0300	.0100	.1000	--	--	--	6.0000	--	--	.0020
3219MD	5.01	89.9	947	5.0	5.0544	.0150	--	.0010	--	--	--	--	5.0000	--	--	--
3219XA	5.02	83.2	893	10.0	6.7728	.0300	--	.5000	.0200	.0030	--	.0100	6.0000	.0070	.0005	--
3219XB	5.02	87.0	926	7.0	5.9570	.0200	--	.0500	.5000	.0020	--	.0015	5.0000	.0030	--	.0005
3219XC	5.02	86.3	925	7.0	6.6812	.0300	--	.0050	.2000	.0018	--	--	6.0000	.0030	--	--
3220B	5.03	81.8	914	7.7	10.4954	.0230	--	.3067	3.0675	--	--	.0107	.7669	.0153	.0046	--
3285A	6.01	89.7	907	9.2	1.1194	.0461	--	.0014	.0092	.0018	--	--	.0923	.0092	--	--
3285B	6.01	88.5	891	10.8	.6570	.0542	--	.0011	.0108	.0022	--	--	.1085	.0163	.0022	--
3285C	6.01	89.7	903	9.6	.6617	.0481	--	.0144	.0038	.0017	--	--	.0962	.0010	--	--
3285P	6.02	81.1	820	17.9	1.0149	.0298	--	.0060	--	--	--	--	.2976	--	--	--
3285FA	6.03	89.1	899	10.0	.8895	.0500	--	.0010	.0050	--	--	--	.1000	.0200	.0020	--
3285FB	6.03	84.5	849	15.0	.4571	.0300	--	.0010	--	.0030	--	--	.1000	.0015	--	--
3285FC	6.03	89.9	902	9.7	.3941	.0292	--	.0015	.0049	.0017	--	--	.1459	.0019	--	--
3285SA	6.04	88.8	890	10.9	.2826	.0547	--	.0011	.0109	--	--	--	.1094	.0033	--	--
3285SB	6.04	90.0	902	9.7	.3023	.0292	--	.0005	--	.0019	--	--	.1462	.0010	--	--
3285BA	6.05	89.0	897	10.3	.7485	.0440	--	.0073	.0059	--	--	--	.2199	--	--	--
3285BB	6.05	89.0	897	10.2	.7970	.0408	--	.0014	.0082	--	--	--	.2041	--	--	--
3285VA	6.06	90.1	906	9.4	.4847	.0282	--	.0009	.0094	.0016	--	--	.0940	.0047	.0005	--
3285VB	6.06	89.3	899	10.0	.6567	.0300	--	.0010	.0050	--	--	--	.1500	.0030	--	--
3285VC	6.06	90.6	911	8.9	.5437	.0267	--	.0018	.0062	.0018	--	--	.1779	.0044	--	--
3285WA	6.07	88.8	890	11.0	.2732	.0329	--	.0011	--	--	--	--	.1535	--	--	--
3285WB	6.07	89.9	903	9.7	.3953	.0277	--	.0014	.0097	--	--	--	.1385	.0028	--	--
3285XA	6.08	90.5	910	9.0	.5186	.0385	--	.0019	.0051	--	--	--	.1282	.0026	--	--
3285XB	6.08	88.9	893	10.6	.4988	.0318	--	.0021	.0053	.0021	--	--	.1062	.0074	.0011	--
3285Z	6.09	89.3	901	9.8	.8522	.0280	--	.0210	.0070	--	--	--	.2101	.0070	--	--
3289QA	7.01	87.6	898	10.0	2.3596	.0500	.0050	.0100	--	--	--	.0002	.0700	.0005	--	--
3289QC	7.01	87.8	902	9.6	2.5903	.0479	.0096	.0144	.0048	--	--	--	.0670	.0067	--	.0019
3289VA	7.02	89.3	896	10.4	.3976	.0311	--	.0155	.0052	--	--	--	.1035	.0031	--	.0005
3289VB	7.02	89.5	901	9.9	.5809	.0296	--	.0148	--	--	--	--	.1482	.0020	--	.0020
3289VC	7.02	85.7	860	13.9	.4069	.0464	--	.0093	.0037	--	--	--	.0928	.0009	--	.0006
3289K	7.03	88.0	886	11.3	.6613	.0452	--	.0113	--	--	--	--	.2262	--	--	--
3289LA	7.04	89.2	906	9.3	1.5000	.0278	.0065	.0185	.0037	.0016	--	.0002	.4630	.0009	--	.0019
3289LB	7.04	88.1	893	10.6	1.2979	.0317	.0053	.0159	.0053	.0018	--	.0002	.1057	.0074	--	.0032
3289LC	7.04	89.8	908	9.1	1.0679	.0455	.0064	.0182	.0045	.0016	--	.0002	.0909	.0091	--	.0018
3289XA	7.05	83.0	850	14.7	2.2548	.0490	.0069	.0294	.0196	.0020	--	.0002	.0980	.0005	--	--
3289XB	7.05	84.7	853	14.6	.7678	.0971	.0049	.0068	--	.0019	--	--	.0485	.0015	--	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	B
3257VA	4.03	--	--	--	--	.0041	--	--	--	--	--	--	--	--	--
3257VB	4.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3217A	4.04	--	--	--	--	.0020	--	--	--	--	--	--	--	--	--
3217B	4.04	--	--	--	--	.0179	--	--	--	--	--	--	--	--	.0012
3217C	4.04	--	--	--	--	.0067	--	.0005	--	--	--	--	--	--	.0010
3217D	4.04	--	--	--	--	.0050	--	--	--	--	--	--	--	--	.0007
3217MA	4.05	--	--	--	--	.0013	--	--	--	--	--	--	--	--	.0001
3217MB	4.05	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3217MC	4.05	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3217MD	4.05	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3218A	4.06	--	--	--	--	.0010	--	--	--	.0009	--	--	--	--	--
3218D	4.06	--	--	--	--	.0010	--	--	--	--	--	--	--	--	--
3219MA	5.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3219MB	5.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3219MC	5.01	--	--	--	--	.0010	--	--	--	--	--	--	--	--	--
3219MD	5.01	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3219XA	5.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3219XB	5.02	--	--	--	--	.0010	--	--	--	--	--	--	--	--	--
3219XC	5.02	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3220P	5.03	--	--	--	--	1.5337	.0307	.0307	.0031	.7669	.0015	.0307	--	--	--
3285A	6.01	--	--	--	--	.0014	--	.0004	--	.0009	--	--	--	--	--
3285B	6.01	--	--	--	--	.0008	--	--	--	--	--	--	--	--	.0004
3285C	6.01	--	--	--	--	.0010	--	--	--	--	--	--	--	--	.0004
3285P	6.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3285FA	6.03	--	--	--	--	.0010	--	--	--	.0010	--	--	--	--	--
3285FB	6.03	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0004
3285FC	6.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3285SA	6.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3285SB	6.04	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3285BA	6.05	--	--	--	--	.0015	--	--	--	--	--	--	--	--	--
3285PB	6.05	--	--	--	--	.0014	--	--	--	--	--	--	--	--	.0008
3285VA	6.06	--	--	--	--	.0009	--	.0005	--	--	--	--	--	--	--
3285VB	6.06	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3285VC	6.06	--	--	--	--	.0009	--	--	--	--	--	--	--	--	.0004
3285WA	6.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3285WB	6.07	--	--	--	--	.0006	--	--	--	--	--	--	--	--	--
3285XA	6.08	--	--	--	--	.0006	--	--	--	--	--	--	--	--	--
3285XB	6.08	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3285Z	6.09	--	--	--	--	--	--	--	--	.1401	--	--	--	--	--
3289QA	7.01	--	--	--	--	.0015	--	--	.0009	--	--	--	--	--	.0005
3289QC	7.01	--	--	--	--	.0007	--	.0005	.0008	.0008	--	--	--	--	.0004
3289VA	7.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3289VB	7.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3289VC	7.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3289K	7.03	--	--	--	--	.0009	--	--	--	--	--	--	--	--	.0009
3289LA	7.04	--	--	--	--	.0019	--	--	--	--	--	--	--	--	.0005
3289LB	7.04	--	--	--	--	.0016	--	--	--	.0009	--	--	--	--	.0005
3289LC	7.04	--	--	--	--	.0018	--	--	--	--	--	--	--	--	.0006
3289XA	7.05	--	--	--	--	.0029	--	--	--	.0010	.0005	--	--	--	.0007
3289XB	7.05	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0004

Tolovana Data--Continued

Sample	Site	Pe	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3257VA	4.03	--	--	.0007	.4121	.0096	.0041	.0012	.4121	3.64	13.2	3,301	250	481
3257VB	4.03	--	--	.0004	.0714	.0071	.0048	--	.1190	2.10	6.8	3,390	500	285
3217A	4.04	--	--	.0002	.0700	.0030	.0015	--	.0700	5.00	8.5	2,825	333	283
3217B	4.04	.0001	--	.0012	.3571	.0357	.0060	.0083	1.7857	4.20	4.4	3,329	750	186
3217C	4.04	.0001	--	.0010	.4808	.0288	.0019	.0067	.9615	5.20	9.2	4,595	500	478
3217D	4.04	--	--	.0010	.2970	.0297	.0050	.0030	.9901	5.05	8.9	4,455	500	450
3217MA	4.05	--	--	.0009	.2564	.1709	.0017	.0026	.5983	5.85	10.5	1,496	143	175
3217MB	4.05	--	--	.0003	.1808	.0090	.0014	.0018	.2712	5.53	10.0	4,997	500	553
3217MC	4.05	--	--	.0002	.2041	.0051	.0020	.0010	.5102	4.90	12.6	2,939	233	412
3217MD	4.05	--	--	.0005	.1500	.0030	.0015	--	.1500	5.00	9.0	895	100	90
3218A	4.06	--	--	.0002	.1000	.0100	.0020	.0015	2.0000	5.00	12.4	1,241	100	177
3218D	4.06	--	--	.0007	.3000	.0050	.0050	.0150	.3000	5.00	18.0	1,287	71	257
3219MA	5.01	--	--	.0005	.1000	.0050	.0010	--	.1500	5.00	12.4	4,333	350	619
3219MB	5.01	--	--	.0005	.7000	.0030	.0020	--	.0150	5.00	17.6	1,257	71	251
3219MC	5.01	--	--	.0002	.1000	.0020	.0020	.0010	.0700	5.00	17.7	2,955	167	591
3219MD	5.01	--	--	--	.0150	.0010	.0020	--	.0200	5.00	18.0	5,996	333	1,199
3219XA	5.02	--	--	.0003	.0700	.0100	.0200	.0015	.1000	5.00	8.3	2,774	333	277
3219XB	5.02	--	--	.0005	.3000	.0070	.0015	--	.0700	5.00	12.4	4,352	350	622
3219XC	5.02	--	--	.0007	.2000	.0200	--	.0700	.1500	5.00	12.3	2,877	233	411
3220B	5.03	--	.1074	.0077	3.0675	.1534	.0307	.0767	.4601	3.26	10.7	3,557	333	464
3285A	6.01	--	--	.0046	.6458	.0185	.0046	.0065	.2768	5.42	9.7	1,944	200	211
3285B	6.01	--	--	.0008	.2169	.0217	.0033	.0011	.2169	4.61	8.2	1,632	200	150
3285C	6.01	--	--	.0010	.2885	.0096	.0029	.0010	.1923	5.20	9.3	1,866	200	194
3285P	6.02	--	--	.0089	.2976	.0119	.0060	.1786	.1786	.84	4.5	2,726	600	153
3285FA	6.03	--	--	.0015	.3000	.1000	.0030	.0050	.3000	5.00	8.9	1,782	200	178
3285FB	6.03	--	--	.0005	.1500	.0150	.0020	.0030	.1500	5.00	5.6	2,818	500	188
3285FC	6.03	--	--	.0005	.0973	.0097	.0019	.0015	.0973	5.14	9.2	3,080	333	317
3285SA	6.04	--	--	.0003	.0766	.0022	.0022	--	.0219	4.57	8.1	1,623	200	148
3285SB	6.04	--	--	.0003	.0487	.0049	.0010	--	.0682	5.13	9.2	3,076	333	316
3285BA	6.05	--	--	.0007	.2199	.0147	.0073	.0073	.2199	3.41	8.7	2,023	233	197
3285BB	6.05	--	--	.0014	.3061	.0143	.0041	.0102	.2041	2.45	8.7	2,180	250	214
3285VA	6.06	--	--	.0009	.1880	.0094	.0019	.0028	.1410	5.32	9.6	3,196	333	340
3285VB	6.06	--	--	.0020	.3000	.0100	.0020	.0030	.1500	5.00	8.9	2,978	333	298
3285VC	6.06	--	--	.0006	.1779	.0089	.0018	.0009	.1335	5.62	10.2	3,393	333	381
3285WA	6.07	--	--	.0002	.0329	.0044	.0044	--	.0439	2.28	8.1	2,698	333	246
3285WB	6.07	--	--	.0007	.1385	.0042	.0021	--	.0693	3.61	9.3	3,246	350	335
3285XA	6.08	--	--	.0006	.1282	.0128	.0038	.0038	.1923	3.90	10.1	2,353	233	262
3285XB	6.08	--	--	.0011	.2123	.0159	.0032	.0032	.1062	4.71	8.4	2,791	333	263
3285Z	6.09	--	--	.0021	.2801	.0280	.0028	.0280	.0980	3.57	9.1	3,190	350	325
3289QA	7.01	--	--	.0010	.1500	.0500	.0100	.0100	2.0000	5.00	8.8	1,753	200	175
3289QC	7.01	--	--	.0067	.9579	.0192	.0096	.0048	1.4368	5.22	9.2	1,834	200	191
3289VA	7.02	--	--	.0007	.1035	.0207	.0072	.0021	.1035	4.83	8.6	2,874	333	278
3289VB	7.02	--	--	.0010	.1976	.0198	.0099	.0069	.1482	5.06	9.1	3,020	333	306
3289VC	7.02	--	--	.0005	.0928	.0093	.0093	.0014	.1391	5.39	6.2	1,847	300	133
3289K	7.03	--	--	.0011	.1131	.0226	.0113	.0023	.2262	2.21	7.8	1,945	250	172
3289LA	7.04	--	--	.0014	.2778	.0278	.0093	.0093	.6481	5.40	9.6	3,213	333	347
3289LB	7.04	--	--	.0032	.5285	.0317	.0159	.0106	.5285	4.73	8.3	2,779	333	263
3289LC	7.04	--	--	.0009	.1818	.0455	.0136	.0091	.6364	5.50	9.9	1,977	200	217
3289XA	7.05	--	--	.0098	.9804	.0490	.0147	.0098	.9804	5.10	5.6	1,694	300	115
3289XP	7.05	--	--	.0005	.0971	.0146	.0019	.0068	.4854	5.15	5.8	872	150	60

Tolovana Data--Continued

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3289XC	7.05	89.2	901	9.8	.9972	.0686	.0049	.0147	--	.0017	--	--	.0980	.0010	--	--
3289XD	7.05	86.9	900	9.7	3.4499	.0484	.0145	.0291	.0068	--	--	--	.0969	.0029	--	.0015
3289XE	7.05	89.7	903	9.7	.6744	.0484	.0048	.0145	--	.0029	--	.0002	.0967	--	--	.0005
3289RA	7.06	85.2	860	13.9	.9260	.0647	--	.0139	.0092	.0018	--	--	.1386	.0139	.0006	.0014
3289RP	7.06	88.3	901	9.7	2.0747	.0484	--	.0097	.9671	--	--	.0010	.1934	.0048	--	.0015
3289RC	7.06	89.6	902	9.7	.6727	.0292	--	.0195	.0146	--	--	--	.1459	.0097	.0010	.0010
3289RD	7.06	90.3	908	9.2	.5898	.0458	--	.0092	.0037	--	--	--	.1374	.0027	--	.0009
3289RE	7.06	88.7	893	10.6	.6925	.0530	--	.0159	.0042	.0019	--	--	.1589	.0053	--	.0016
3289SA	7.07	88.7	898	10.1	1.1719	.0302	--	.0151	.1512	.0030	--	--	.1512	.0071	.0005	.0302
3289SB	7.07	89.3	899	10.0	.6510	.0300	--	.0200	.1000	--	--	--	.1500	.0020	--	.0015
3289SC	7.07	89.5	908	9.0	1.4732	.0451	--	.0181	.1354	--	--	--	.1354	.0027	--	.4513
3289SD	7.07	89.0	899	10.0	.9742	.0500	--	.0150	.1500	--	--	.0002	.1500	.0070	.0005	.0030
3289SE	7.07	88.9	899	10.0	1.1100	.0500	--	.0200	.1000	--	--	--	.1500	.0050	--	.0070
3289TA	7.08	87.6	914	8.3	4.1571	.0354	.0059	.2358	.8255	--	--	--	.1769	.0083	.0018	.1179
3289TB	7.08	88.8	919	7.8	3.3767	.0558	--	.2232	.5580	--	--	.0002	.1674	.0078	.0006	.2232
3289TC	7.08	85.0	881	11.5	3.5559	.0344	--	.8028	.5734	--	--	.0002	.1147	.0023	--	.0115
3289TD	7.08	85.2	891	10.4	4.3663	.0313	.0052	.5208	.7292	--	--	.0003	.1042	.0104	.0021	.1563
3289TE	7.08	84.0	890	10.4	5.5424	.0417	.0417	.0208	1.0417	--	--	--	.3125	.0146	.0042	.0417
3289UA	7.09	89.9	900	10.0	.1488	.0070	--	.0070	--	.0018	--	--	.1000	--	--	--
3289UB	7.09	89.9	904	9.5	.5424	.0476	--	.0019	.0038	.0048	--	--	.0952	.0010	--	--
3289UC	7.09	90.1	903	9.6	.2558	.0482	--	.0067	--	.0017	--	--	.0963	.0005	--	--
3289WA	7.10	89.8	905	9.5	.6820	.0473	--	.0066	--	.0019	--	--	.0947	--	--	--
3289WB	7.10	92.5	928	7.1	.3218	.0510	--	.0051	--	.0018	--	--	.0714	.0010	--	--
3289WC	7.10	89.1	895	10.5	.3701	.0315	--	.0053	.0053	.0074	--	--	.1050	.0011	--	--
3289P1	7.11	89.2	902	9.7	1.1552	.0414	--	.0138	.0055	.0024	--	--	.6906	.0007	--	.0007
3289P2	7.11	87.2	885	11.4	1.4014	.0568	.0170	.0568	.0341	.0023	--	.0002	.7955	.0011	--	.0227
3289YA	7.12	85.7	891	10.5	3.8218	.0157	--	.0210	.0073	--	--	--	.0734	.0031	--	.0010
3289YC	7.12	87.7	898	10.0	2.3479	.0300	--	.0150	--	--	--	--	.0700	.0005	--	.0050
3289MA	7.13	89.9	902	9.8	.3187	.0488	--	.0098	--	--	--	--	.0977	.0010	--	--
3289MB	7.13	89.6	900	10.0	.3670	.0300	--	.0050	--	--	--	--	.0700	.0005	--	--
3289MC	7.13	91.2	924	7.4	1.3861	.0319	--	.2128	.2128	--	--	.0011	.1064	.0021	.0005	.0213
3289ZA	7.14	86.3	901	9.5	4.2028	.0474	--	.2846	.9488	--	--	.0002	.1423	.0095	.0019	.1898
3289ZB	7.14	87.1	897	10.0	2.8909	.0300	--	.5000	.7000	--	--	.0005	.2000	.0100	.0010	.0100
3289ZC	7.14	90.1	928	7.0	2.9307	.0300	--	.2000	1.0000	--	--	.0005	.2000	.0100	.0010	.0070
3289NA	7.15	90.2	907	9.2	.6044	.0462	--	.0139	.0046	--	--	--	.1386	.0014	--	.0014
3289NC	7.15	87.9	898	10.0	2.1152	.0300	--	.5000	.5000	--	--	.0002	.1500	.0030	--	.0030
3289JA	7.16	84.5	894	10.0	5.5067	.0200	--	.0100	.0500	--	--	--	.0500	.0005	--	--
3289JB	7.16	88.0	905	9.3	2.7568	.0463	--	.0093	.0046	--	--	--	.1389	.0046	.0005	.0046
3289JC	7.16	84.9	892	10.3	4.8072	.0513	--	.0154	.7187	--	--	--	.0719	.0051	.0005	.0051
3289JD	7.16	89.5	906	9.3	1.2352	.0278	--	.0093	.2778	.0019	--	.0005	.0926	.0009	--	.0028
3289JE	7.16	89.8	904	9.5	.7099	.0285	--	.0066	--	.0019	--	--	.0949	.0005	--	--
3289GP	7.16	89.8	906	9.4	.8286	.0187	.0140	.0281	.0037	--	--	--	.0936	.0009	--	.0047
3289GC	7.16	88.4	898	10.0	1.6363	.0300	--	.0300	.0050	--	--	--	.2000	.0050	--	.0050
3289GD	7.16	87.9	894	10.4	1.7713	.0311	--	.0207	--	--	--	.0002	.1037	.0021	--	.0016
3289GE	7.16	87.0	878	12.0	.9325	.0181	--	.0241	--	.0024	--	--	.1205	--	--	--
3216A	7.17	89.9	907	9.3	.8609	.0926	--	.0019	--	.0037	--	--	.3704	.0056	--	--
3216B	7.17	86.2	885	11.2	2.6092	.0448	--	.0011	.0090	--	--	--	1.1211	.0112	--	--
3070A	8.01	87.9	890	10.8	1.3226	.0148	--	.0003	--	--	--	--	.4921	.0020	.0010	--
3070B	8.01	87.2	877	12.3	.5384	.0204	--	.0005	--	--	--	--	.3067	.0005	--	--
3070C	8.01	86.2	865	13.5	.3093	.0200	--	.0003	--	--	--	--	.2000	--	--	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	B
3289XC	7.05	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3289XD	7.05	--	--	--	--	.0194	--	.0019	.0048	.0019	--	.0029	--	--	.0019
3289XE	7.05	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3289RA	7.06	--	--	--	--	.0006	--	.0018	--	.0009	--	--	--	--	--
3289RB	7.06	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3289RC	7.06	--	--	--	--	.0015	--	--	--	--	.0005	--	--	--	--
3289RD	7.06	--	--	--	--	.0009	--	--	--	--	--	--	--	--	--
3289RE	7.06	--	--	--	--	.0011	--	--	--	--	--	--	--	--	--
3289SA	7.07	--	--	--	--	.0020	--	--	--	.0706	--	--	--	--	--
3289SB	7.07	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289SC	7.07	--	--	--	--	.0018	--	.0027	--	.0008	--	--	--	--	--
3289SD	7.07	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289SE	7.07	--	--	--	--	.0005	--	--	--	.0300	.0005	--	--	--	--
3289TA	7.08	--	--	--	--	.0059	--	.0236	.0012	.1179	.0008	.0236	--	--	--
3289TB	7.08	--	--	--	--	.0011	--	.0112	.0009	.0781	.0011	.0335	--	--	--
3289TC	7.08	--	--	--	--	.0229	--	.0172	--	.0573	.0006	.0115	--	--	--
3289TD	7.08	--	--	--	--	.0729	--	.0031	.0009	.2083	.0005	--	--	--	--
3289TE	7.08	--	--	--	--	.0021	--	.0021	.0018	.4167	.0031	.0313	--	--	--
3289UA	7.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3289UB	7.09	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289UC	7.09	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289WA	7.10	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3289WB	7.10	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289WC	7.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3289P1	7.11	--	--	--	--	.0006	--	--	--	--	--	--	--	--	--
3289P2	7.11	--	--	--	--	.0034	--	--	--	--	--	--	--	--	--
3289YA	7.12	--	--	--	--	.0010	--	--	--	.0010	--	--	--	--	--
3289YC	7.12	--	--	--	--	.0010	--	--	--	--	--	--	--	--	.0004
3289MA	7.13	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3289MB	7.13	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3289MC	7.13	--	--	--	--	.0007	--	.0106	--	.1064	.0007	--	--	--	--
3289ZA	7.14	--	--	--	--	.0190	--	.0142	.0009	.0949	.0014	.0474	--	--	--
3289ZB	7.14	--	--	--	--	.0015	--	.0100	.0009	.1000	.0020	.0500	--	--	--
3289ZC	7.14	--	--	--	--	.0150	--	.0500	.0009	.1000	.0015	.0070	--	.0009	--
3289NA	7.15	--	--	--	--	.0009	--	--	--	--	--	--	--	--	--
3289NC	7.15	--	--	--	--	.0010	--	--	--	--	--	--	--	--	--
3289JA	7.16	--	--	--	--	.0007	.0500	--	--	--	.0100	.0300	--	--	--
3289JB	7.16	--	--	--	--	.0019	--	--	.0008	.0009	--	--	--	--	--
3289JC	7.16	--	--	--	--	.0015	.0103	.0010	.0009	.0719	.0010	--	--	.0021	.0004
3289JD	7.16	--	--	--	--	.0006	--	--	.0008	.0463	--	--	--	--	--
3289JE	7.16	--	--	--	--	.0009	--	--	--	--	--	--	--	--	--
3289GB	7.16	--	--	--	--	.0014	--	--	--	--	--	--	--	--	--
3289GC	7.16	--	--	--	--	.0150	.0100	--	--	.0009	--	--	--	--	--
3289GD	7.16	--	--	--	--	.0021	--	.0010	--	.0009	--	--	--	--	--
3289GE	7.16	--	--	--	--	.0024	--	.0060	--	--	--	--	--	--	--
3216A	7.17	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3216B	7.17	--	--	--	--	.0011	--	.0224	--	--	.0016	--	--	--	--
3070A	8.01	--	--	--	--	--	--	--	.0010	.4921	--	--	--	--	--
3070B	8.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3070C	8.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Tolovana Data--Continued

Sample	Site	Be	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3289XC	7.05	--	--	.0015	.2941	.0147	.0020	.0049	.4902	5.10	9.1	1,300	143	133
3289XD	7.05	.0003	.0039	.0048	.9690	.1938	.0097	.0969	1.9380	5.16	9.0	1,793	200	185
3289XF	7.05	--	--	.0007	.1934	.0145	.0048	.0019	.2901	5.17	9.3	1,854	200	192
3289RA	7.06	--	--	.0018	.1848	.0185	.0046	.0065	.4621	5.41	6.1	1,317	214	95
3289RB	7.06	--	--	.0019	.4836	.0193	.0484	.0048	.2901	5.17	9.1	1,825	200	189
3289RC	7.06	--	.0039	.0015	.1946	.0195	.0292	.0068	.1946	5.14	9.2	3,070	333	316
3289RD	7.06	--	--	.0009	.1832	.0183	.0018	.0018	.1832	5.46	9.9	1,971	200	215
3289RF	7.06	--	--	.0016	.2119	.0159	.0021	.0074	.2119	4.72	8.4	1,675	200	158
3289SA	7.07	--	--	.0020	.5040	.0202	.0302	.0030	.1512	4.96	8.8	2,935	333	291
3289SB	7.07	--	--	.0010	.1500	.0150	.0300	.0010	.1500	5.00	8.9	2,978	333	298
3289SC	7.07	--	--	.0014	.4513	.0135	.0271	.0063	.1805	5.54	9.9	1,983	200	220
3289SD	7.07	--	.0300	.0010	.3000	.0150	.1000	.0020	.1500	5.00	8.9	1,781	200	178
3289SE	7.07	--	--	.0020	.5000	.0200	.0200	.0050	.2000	5.00	8.9	1,778	200	178
3289TA	7.08	--	.0118	.0059	1.1792	.0825	.0590	.0590	1.1792	4.24	10.6	2,476	233	300
3289TB	7.08	--	.0223	.0056	1.1161	.0558	.2232	.0335	.5580	4.48	11.4	1,591	140	204
3289TC	7.08	--	--	.0034	.8028	.1147	.1720	.0115	.8028	4.36	7.4	2,470	333	215
3289TD	7.08	--	.0104	.0104	1.0417	.1563	.2083	.0521	1.0417	4.80	8.2	2,727	333	262
3289TE	7.08	--	--	.0104	2.0833	.2083	.2083	.0146	1.0417	2.40	8.1	2,017	250	194
3289UA	7.09	--	--	--	.0100	.0020	.0010	--	.0200	5.00	9.0	12,836	1,429	1,284
3289UB	7.09	--	--	.0010	.2857	.0048	.0010	--	.0952	5.25	9.4	1,889	200	198
3289UC	7.09	--	--	.0003	.0289	.0029	.0014	.0010	.0674	5.19	9.4	1,871	200	194
3289WA	7.10	--	--	.0005	.0473	.0066	.0028	--	.4735	5.28	9.5	1,898	200	200
3289WB	7.10	--	--	.0002	.0306	.0051	.0020	--	.1531	4.90	13.0	1,814	140	254
3289WC	7.10	--	--	.0003	.1050	.0032	.0011	--	.1050	4.76	8.5	2,828	333	269
3289P1	7.11	--	--	.0010	.0967	.0207	.0028	.0021	.2762	3.62	9.2	2,152	233	223
3289P2	7.11	--	--	.0023	.1705	.0080	.0023	.0011	.2273	4.40	7.7	1,535	200	135
3289YA	7.12	--	--	.0105	1.5723	.0105	.0052	.0031	2.0964	4.77	8.2	5,450	667	520
3289YC	7.12	--	--	.0020	.2000	.0150	.0070	.0020	2.0000	5.00	8.8	2,922	333	292
3289MA	7.13	--	--	.0005	.0488	.0098	.0029	.0015	.0977	5.12	9.2	1,841	200	189
3289MB	7.13	--	--	.0010	.1500	.0050	.0020	.0030	.1000	5.00	9.0	2,988	333	299
3289MC	7.13	--	--	.0016	.5319	.0213	.0160	.0016	.1064	4.70	12.2	2,857	233	384
3289ZA	7.14	--	.0047	.0047	1.8975	.0474	.1898	.0664	.1898	5.27	9.1	1,819	200	192
3289ZB	7.14	--	.0050	.0050	1.0000	.0500	.0500	.0150	.1500	5.00	8.7	2,904	333	290
3289ZC	7.14	--	.0300	.0020	1.0000	.0500	.0700	.0050	.1500	5.00	12.9	3,002	233	429
3289NA	7.15	--	--	.0009	.1848	.0139	.0065	.0065	.1848	5.41	9.8	1,951	200	211
3289NC	7.15	--	--	.0010	.7000	.0200	.0020	.0050	.2000	5.00	8.8	2,929	333	293
3289JA	7.16	--	.0040	.0015	.2000	.0100	5.0000	--	.0700	5.00	8.4	4,225	500	422
3289JB	7.16	--	--	.0028	.6481	.0185	.0139	.0093	1.8519	5.40	9.5	1,900	200	205
3289JC	7.16	--	1.0267	.0051	1.5400	.0308	.2053	.0154	1.0267	4.87	8.3	1,654	200	161
3289JD	7.16	--	--	.0009	.4630	.0185	.0093	.0046	.2778	5.40	9.7	3,222	333	348
3289JF	7.16	--	--	.0007	.0664	.0190	.0095	.0066	.4744	5.27	9.5	3,155	333	333
3289GB	7.16	--	--	.0014	.1404	.0281	.0187	.0066	.4682	5.34	9.6	4,796	500	512
3289GC	7.16	--	--	.0015	.3000	.0200	.0070	.0070	1.0000	5.00	8.8	2,945	333	295
3289GD	7.16	--	--	.0031	.5187	.0311	.0104	.0073	1.0373	4.82	8.5	2,823	333	272
3289GE	7.16	--	--	.0012	.1205	.0241	.0084	.0024	.6024	4.15	7.2	4,815	667	400
3216A	7.17	--	--	.0009	.0926	.0037	.0093	.0019	.2778	2.70	9.7	971	100	105
3216B	7.17	--	.1121	.0067	.6726	.0224	.2242	.0224	.3363	2.23	7.7	1,922	250	171
3070A	8.01	--	--	.0015	.1476	.0689	.0020	.0010	.0984	5.08	8.1	5,950	733	550
3070B	8.01	--	--	.0001	.1022	.0020	.0015	.0020	.1022	4.89	7.1	4,264	600	347
3070C	8.01	--	--	--	.0150	.0020	.0010	.0010	.0700	5.00	6.4	4,310	675	319

Tolovana Data--Continued

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3071A	9.01	89.3	903	9.6	1.1526	.0144	--	.0002	.0067	--	--	--	.9597	.0048	.0010	--
3071B	9.01	88.8	897	10.2	.9664	.0102	--	.0005	.0041	--	--	--	.7143	.0010	.0005	--
3071C	9.01	89.0	906	9.2	1.7820	.0150	--	.0150	.0070	--	--	--	1.0000	.0030	.0010	--
3072A	10.01	82.3	829	17.0	.6064	.0103	--	.0031	--	.0031	--	--	.5165	--	--	--
3072B	10.01	88.4	892	10.7	.8631	.0195	--	.0019	.0049	--	--	--	.1462	.0049	.0010	--
3072C	10.01	89.3	897	10.3	.4471	.0147	--	.0010	--	.0020	--	--	.0980	.0010	--	--
3072D	10.01	89.4	899	10.1	.5272	.0201	--	.0070	--	.0020	--	--	.1006	.0015	.0005	--
3072E	10.01	87.2	879	12.0	.8318	.0208	--	.0010	--	.0031	--	--	.1042	.0010	--	--
3230A	11.01	89.1	897	10.2	.7259	.0306	--	.0010	--	--	--	--	.5102	--	--	--
3230B	11.01	87.5	902	9.5	3.0327	.0189	--	.0009	--	.0017	--	--	2.8409	--	--	--
3230C	11.01	88.3	898	10.0	1.7055	.0300	--	.0015	--	--	--	--	1.0000	.0020	--	--
3230X1A	11.02	89.7	902	9.7	.5674	.0146	--	.0005	--	--	--	--	.4854	--	--	--
3230X1B	11.02	90.9	914	8.5	.6121	.0366	--	.0012	--	.0021	--	--	.2439	.0037	--	--
3230X1C	11.02	89.4	911	8.7	1.8894	.0262	--	.0006	--	--	--	--	1.7452	--	--	--
3230X2A	11.03	89.2	915	8.3	2.5295	.0238	--	.0008	--	.0024	--	--	2.3753	.0012	--	--
3230X2B	11.03	92.3	945	5.3	2.4068	.0745	--	.0005	--	--	--	--	2.1277	.0016	--	--
3230X3A	11.04	89.8	929	6.8	3.3887	.0195	--	.0029	--	--	--	.0049	2.9240	.0049	--	--
3230X3B	11.04	89.7	907	9.2	1.1010	.0462	--	.0014	--	.0092	--	--	.9242	--	--	--
3230X3C	11.04	87.4	892	10.6	2.0045	.0317	.0074	.1586	--	--	--	.0011	1.0571	.0032	--	--
3230RA	11.05	89.5	927	7.0	3.4716	.0200	--	.0030	--	--	--	.0005	3.0000	.0050	.0005	--
3230RB	11.05	91.6	935	6.4	2.0344	.0458	--	.0027	--	--	--	--	1.8315	.0018	--	--
3230RC	11.05	89.8	929	6.9	3.2788	.0493	--	.0020	--	.0017	--	--	2.9586	.0049	--	--
3226A	12.01	86.4	887	11.0	2.5865	.0769	--	.0011	--	--	--	.0002	.3297	.0033	--	--
3226B	12.01	83.6	854	14.3	2.1488	.0095	--	.0007	--	--	--	--	.4762	.0095	--	--
3226VA	12.02	86.2	896	10.0	3.7627	.1000	--	.0005	--	--	--	--	2.0000	.0070	--	--
3226VB	12.02	87.3	897	10.0	2.7101	.0500	--	.0003	--	--	--	--	2.0000	.0050	--	--
3226VC	12.02	89.7	928	7.0	3.2510	.0300	--	.0010	--	--	--	--	.5000	.0050	--	.0010
3226XA	12.03	85.9	887	11.0	3.1610	.0330	--	.0220	--	--	--	.0033	.5495	.0022	--	--
3226XC	12.03	86.5	888	10.9	2.5899	.0217	--	.0109	.0543	--	--	.0033	.2174	.0076	--	--
3226RA	12.04	89.2	901	9.8	1.0283	.0294	--	.0020	.0049	--	--	--	.4902	.0049	--	--
3226RB	12.04	91.4	929	7.0	1.5858	.0300	--	.5000	.0070	--	--	.0002	.5000	.0100	.0015	--
3226RC	12.04	83.8	848	15.0	1.2354	.0300	--	.0150	--	--	--	--	.5000	.0050	--	--
3226SA	12.05	87.9	898	10.0	2.1394	.2000	--	.0150	.0200	--	--	--	1.0000	.0200	.0070	.0200
3226SB	12.05	87.4	897	10.0	2.6359	.0500	--	.5000	.0300	--	--	--	1.0000	.0150	.0020	.0005
3226SC	12.05	87.2	897	10.0	2.8038	.0500	--	.5000	.1000	--	--	.0005	1.0000	.0100	.0020	.0010
3226TA	12.06	88.1	898	10.0	1.8761	.0500	--	.3000	.0150	--	--	--	1.0000	.0150	.0020	.0007
3226TB	12.06	86.8	897	10.0	3.2285	.0500	--	.2000	.0150	.0020	--	--	1.0000	.0150	.0020	.0020
3226TC	12.06	86.1	896	10.0	3.8671	.0700	--	.7000	.0500	--	--	.0500	1.0000	.1000	.0050	.0010
3227A	13.01	86.8	897	10.0	3.1684	.0100	.0050	.0030	--	--	--	.0010	2.0000	--	--	--
3227B	13.01	86.9	897	10.0	3.1136	.0150	--	.0030	.0050	--	--	.0010	2.0000	--	--	--
3227C	13.01	88.2	898	10.0	1.7659	.0100	--	.0030	--	--	--	.0005	1.5000	--	--	--
3227X1	13.02	90.0	908	9.1	.9534	.0182	--	.0009	--	--	--	.0002	.9091	--	--	--
3227X2A	13.03	91.4	916	8.3	.2808	.0250	--	.0025	--	--	--	--	.0417	--	--	--
3227X2B	13.03	86.5	876	12.3	1.2078	.0123	--	.0123	--	.0025	--	.0025	.8600	--	--	--
3227X2C	13.03	86.7	881	11.7	1.6657	.0117	--	.0012	--	--	--	--	.5841	--	--	--
3227RA	13.04	88.7	899	10.0	1.3027	.0200	--	.0200	.0050	.0020	--	.0010	1.0000	--	--	.0015
3227RB	13.04	88.4	895	10.4	1.2353	.0208	--	.0208	--	.0021	--	.0007	1.0395	--	--	.0016
3227RC	13.04	82.7	846	15.0	2.3413	.0200	.0070	.0300	--	.0020	--	.0005	2.0000	--	--	.0070
3227S	13.05	85.9	902	9.3	4.7225	.0267	.0133	.0400	.0933	--	--	.0013	2.0000	.0027	--	.0133
3227YA	13.06	90.0	907	9.3	.7001	.0139	--	.0009	--	--	--	.0002	.4630	--	--	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	P
3071A	9.01	--	--	--	--	--	--	.0007	--	--	--	--	--	--	--
3071B	9.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3071C	9.01	--	--	--	--	--	--	--	--	.0100	--	--	--	--	--
3072A	10.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3072B	10.01	--	--	--	--	--	--	--	.0015	.0195	--	--	--	--	--
3072C	10.01	--	--	--	--	--	--	--	.0010	.0196	--	--	--	--	--
3072D	10.01	--	--	--	--	--	--	--	.0010	.0005	--	--	--	--	--
3072E	10.01	--	--	--	--	.2083	--	.0010	--	.0005	--	--	--	--	--
3230A	11.01	--	--	--	--	.0015	--	--	--	--	--	--	--	--	.0002
3230B	11.01	--	--	--	--	.0009	--	--	--	--	--	--	--	--	.0001
3230C	11.01	--	--	--	--	.0010	--	--	--	.0009	--	--	--	--	.0002
3230X1A	11.02	--	--	--	--	--	--	--	--	.0010	--	--	--	--	--
3230X1B	11.02	--	--	--	--	.0024	--	--	--	.0012	--	--	--	--	.0002
3230X1C	11.02	--	--	--	--	.0006	--	--	--	--	--	--	--	--	.0001
3230X2A	11.03	--	--	--	--	.0008	--	--	--	--	--	--	--	--	.0001
3230X2B	11.03	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3230X3A	11.04	--	--	--	--	.0019	--	--	--	.0010	--	--	--	--	.0003
3230X3B	11.04	--	--	--	--	.0014	--	--	--	--	--	--	--	--	.0001
3230X3C	11.04	--	--	--	--	.0529	.0211	--	--	.0011	--	.0021	--	--	.0002
3230RA	11.05	--	--	--	--	.0010	--	--	.0030	.1000	--	--	--	--	.0001
3230RB	11.05	--	--	--	--	.0006	--	--	--	--	--	--	--	--	.0001
3230RC	11.05	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3226A	12.01	--	--	--	--	.0022	--	--	--	.0016	--	--	--	--	--
3226B	12.01	--	--	--	--	.0014	--	--	--	.0019	--	--	--	--	--
3226VA	12.02	--	--	--	--	.0005	--	--	--	.0009	--	--	--	--	--
3226VB	12.02	--	--	--	--	.0004	--	--	--	.0009	--	--	--	--	--
3226VC	12.02	--	--	--	--	.0005	--	--	.0020	.0010	.0070	--	--	--	--
3226XA	12.03	--	--	--	--	.0011	--	--	--	.0016	--	--	--	--	--
3226XC	12.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3226RA	12.04	--	--	--	--	.0004	--	--	--	.0015	--	--	--	--	--
3226RB	12.04	--	--	--	--	.0004	--	--	--	.0020	--	--	--	--	--
3226RC	12.04	--	--	--	--	.0004	--	--	--	.0300	--	--	--	--	--
3226SA	12.05	--	--	--	--	.0004	--	--	--	.0200	--	--	--	--	--
3226SB	12.05	--	--	--	--	.0004	--	--	.0010	.1500	--	--	--	--	--
3226SC	12.05	--	--	--	--	.0004	--	--	.0009	.1500	--	--	--	--	--
3226TA	12.06	--	--	--	--	.0004	--	--	--	.0100	--	--	--	--	--
3226TB	12.06	--	--	--	--	.0005	--	.0050	--	.0070	--	--	--	--	--
3226TC	12.06	--	--	--	--	.0004	--	.0007	--	.0300	--	--	--	--	--
3227A	13.01	--	--	--	--	.0015	--	--	--	--	--	--	--	--	.0002
3227B	13.01	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3227C	13.01	--	--	--	--	.0010	--	--	--	--	--	--	--	--	.0002
3227X1	13.02	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3227X2A	13.03	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3227X2B	13.03	--	--	--	--	.0006	--	--	--	--	--	--	--	--	.0002
3227X2C	13.03	--	--	--	--	.0023	--	.0006	--	.0018	--	--	--	--	.0004
3227RA	13.04	--	--	--	--	.0015	--	--	--	--	--	--	--	--	.0002
3227RB	13.04	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0002
3227RC	13.04	.0007	--	--	--	.0005	--	--	--	--	--	--	--	--	.0001
3227S	13.05	--	--	--	--	.0013	--	.0013	.0013	.0011	--	--	--	--	--
3227YA	13.06	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0002

Tolovana Data--Continued

Sample	Site	Be	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3071A	9.01	--	--	.0001	.0480	.0067	.0048	.0096	.0960	5.21	9.3	6,200	667	646
3071B	9.01	--	--	.0001	.0204	.0051	.0051	.0010	.2041	4.90	8.7	8,705	1,000	853
3071C	9.01	--	--	.0010	.2000	.0100	.0050	.0150	.5000	5.00	9.7	5,935	613	645
3072A	10.01	--	--	--	.0155	.0021	.0031	.0010	.0517	4.84	4.8	7,971	1,650	468
3072B	10.01	--	--	.0010	.4873	.0146	.0097	.0049	.1462	5.13	8.2	4,536	550	423
3072C	10.01	--	--	.0010	.1471	.0098	.0049	.0490	.0980	5.10	8.7	6,070	700	590
3072D	10.01	--	--	.0015	.1509	.0101	.0101	.0201	.2012	4.97	8.9	4,444	500	442
3072E	10.01	--	--	.0021	.1563	.0156	.1042	.0052	.2083	4.80	7.3	4,185	575	349
3230A	11.01	--	--	.0002	.0204	.0051	.0020	.0015	.1531	4.90	8.7	2,910	333	285
3230B	11.01	.0001	--	.0005	.0189	.0028	.0019	.0028	.1420	5.28	9.2	4,620	500	488
3230C	11.01	--	--	.0010	.1500	.0150	.0030	.0010	.5000	5.00	8.8	2,943	333	294
3230X1A	11.02	--	--	.0001	.0146	.0010	.0010	.0008	.0485	5.15	9.2	6,161	667	635
3230X1B	11.02	--	--	.0012	.0610	.0061	.0024	.0061	.2439	4.10	10.6	2,483	233	291
3230X1C	11.02	--	--	.0003	.0262	.0017	.0013	--	.0873	5.73	10.2	3,414	333	391
3230X2A	11.03	--	--	.0004	.0356	.0024	.0024	.0012	.0831	4.21	10.7	3,754	350	451
3230X2B	11.03	--	--	.0005	.0319	.0053	.0021	.0021	.1596	4.70	17.3	1,239	71	233
3230X3A	11.04	--	--	.0005	.0975	.0292	.0049	.0049	.2924	5.13	13.2	4,606	350	675
3230X3B	11.04	--	--	.0003	.0462	.0046	.0018	.0008	.0647	5.41	9.7	1,940	200	210
3230X3C	11.04	.0001	--	.0011	.1057	.0106	.0211	.0011	.5285	4.73	8.3	2,757	333	261
3230RA	11.05	--	--	.0015	.2000	.0200	.0020	.0150	.1000	5.00	12.8	4,476	350	639
3230RB	11.05	--	--	.0006	.0458	.0064	.0027	.0046	.0916	5.46	14.3	2,000	140	312
3230RC	11.05	--	--	.0010	.0986	.0099	.0020	.0020	.1479	5.07	13.0	1,822	140	264
3226A	12.01	--	--	.0033	.3297	.1648	.0220	.0033	1.6484	4.55	7.9	1,124	143	102
3226B	12.01	--	--	.0048	.4762	.1905	.0190	.0067	.9524	5.25	5.8	8,774	1,500	614
3226VA	12.02	--	--	.0010	.1000	.0500	.0020	.0009	1.5000	5.00	8.6	862	100	86
3226VB	12.02	--	--	.0007	.1500	.2000	.0020	.0009	.3000	5.00	8.7	1,746	200	175
3226VC	12.02	--	--	.0015	.3000	.2000	.0020	2.0000	.2000	5.00	12.8	2,992	233	427
3226XA	12.03	--	--	.0022	.2198	.1099	.0165	.0022	2.1978	4.55	7.8	2,604	333	237
3226XC	12.03	--	--	.0008	.0761	.0217	.0016	--	2.1739	4.60	8.0	3,981	500	366
3226PA	12.04	--	--	.0015	.1961	.0980	.0020	.0015	.1961	5.10	9.1	3,032	333	309
3226RB	12.04	--	--	.0007	.3000	.0300	.0020	.0020	.2000	5.00	13.1	3,047	233	435
3226RC	12.04	--	--	.0015	.3000	.1500	.0015	.0020	.2000	5.00	5.6	2,792	500	186
3226SA	12.05	--	--	.1000	.5000	.0300	.0020	.0050	.2000	5.00	8.8	439	50	44
3226SB	12.05	--	--	.0050	.5000	.0500	.0020	.0300	.3000	5.00	8.7	1,747	200	175
3226SC	12.05	--	.0050	.0070	.7000	.0500	.0200	.0070	.2000	5.00	8.7	1,744	200	174
3226TA	12.06	--	--	.0050	.3000	.0200	.0030	.0050	.1500	5.00	8.8	1,762	200	176
3226TB	12.06	--	--	.0200	.5000	.7000	.0050	.0050	.7000	5.00	8.7	1,735	200	174
3226TC	12.06	--	--	.0200	1.5000	.0200	.0050	.0150	.3000	5.00	8.6	1,230	143	123
3227A	13.01	--	--	.0007	.1000	.0300	.0150	.0020	1.0000	5.00	8.7	8,683	1,000	868
3227B	13.01	--	--	.0007	.0500	.0200	.0150	.0030	1.0000	5.00	8.7	5,792	667	579
3227C	13.01	--	--	.0003	.0300	.0150	.0050	.0009	.2000	5.00	8.8	8,823	1,000	882
3227X1	13.02	--	--	--	.0045	.0009	.0009	--	.0182	5.50	9.9	4,948	500	544
3227X2A	13.03	--	--	.0003	.0250	.0125	.0042	.0025	.1667	6.00	11.0	3,655	333	439
3227X2B	13.03	--	--	.0006	.0369	.0246	.0061	.0037	.2457	4.07	7.0	7,042	1,000	573
3227X2C	13.03	--	--	.0006	.0234	.0234	.1752	.0234	.8178	4.28	7.4	7,417	1,000	635
3227RA	13.04	--	--	.0005	.0300	.0150	.0050	.0010	.2000	5.00	8.9	4,435	500	443
3227RB	13.04	--	--	.0005	.0312	.0104	.0031	--	.1040	4.81	8.5	4,251	500	409
3227RC	13.04	--	--	.0005	.0500	.0150	.0030	.0050	.2000	5.00	5.5	4,133	750	276
3227S	13.05	--	--	.0067	2.0000	.0267	.0267	.2667	.2000	3.75	9.2	3,223	350	345
3227YA	13.06	--	--	.0002	.0185	.0139	.0019	.0019	.1852	5.40	9.7	6,483	667	700

Tolovana Data--Continued

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3227YB	13.06	86.4	869	13.0	.6725	.0173	--	.0009	--	--	--	.0002	.4325	.0173	--	--
3227YC	13.06	92.5	928	7.2	.2332	.0310	--	.0010	--	--	--	.0003	.0103	--	--	--
3069B	14.01	83.5	843	15.6	.9186	.0054	--	.0005	--	--	--	--	.1073	--	--	--
3069C	14.01	84.7	849	15.0	.3426	.0050	--	.0005	--	--	--	--	.1000	--	--	--
3069D	14.01	87.6	883	11.6	.8561	.0105	--	.0005	--	--	--	.0011	.0735	--	--	--
3069E	14.01	84.3	848	15.1	.5323	.0050	--	.0005	--	.0020	--	--	.1512	--	--	--
3165A	15.01	89.8	902	9.8	.4168	.0294	--	.0010	--	.0017	--	.0003	.1471	--	--	--
3165B	15.01	89.5	900	10.0	.4689	.0200	--	.0020	--	--	--	.0002	.2000	--	--	--
3165C	15.01	89.5	902	9.8	.7072	.0293	--	.0010	--	.0020	--	.0002	.4883	--	--	--
3165D	15.01	89.1	894	10.5	.3769	.0158	--	.0007	--	--	--	--	.2105	--	--	--
3165E	15.01	89.7	900	10.0	.3461	.0200	--	.0010	--	--	--	--	.2000	--	--	--
3165XA	15.02	90.9	911	8.8	.2675	.0177	--	.0009	--	--	--	--	.1767	--	--	--
3165XB	15.02	88.9	894	10.6	.4898	.0211	--	.0016	--	--	--	.0002	.2114	--	--	--
3165XC	15.02	89.3	896	10.4	.2669	.0156	--	.0005	--	--	--	.0002	.2083	--	--	--
3284	16.01	85.9	930	6.5	7.6120	.0185	--	.0926	.0185	.0185	--	--	4.6296	.0093	--	.4630
3284CA	16.02	86.3	902	9.4	4.2540	.0188	--	.0376	--	.0038	--	--	3.7594	--	--	.1880
3284CB	16.02	88.6	947	5.0	6.4375	.0167	--	.1667	.0067	.0117	--	--	5.0000	.0033	--	.8333
3284FA	16.03	85.7	896	10.0	4.2800	.0100	--	.0070	.0050	--	--	--	2.0000	.0050	--	--
3284FB	16.03	91.5	928	7.1	1.3284	.0204	--	.0305	--	--	--	--	.5092	.0031	--	.0051
3284FC	16.03	93.0	935	6.5	.5644	.0139	--	.0014	--	--	--	--	.2773	.0014	--	--
3284MA	16.04	89.7	928	7.0	3.2888	.0200	--	.0010	--	--	--	--	3.0000	.0010	--	--
3284MB	16.04	86.0	906	9.0	5.0385	.0627	.0090	.0896	--	.0018	--	.0002	4.4803	.0063	--	.0045
3284MC	16.04	83.8	894	9.9	6.2457	.0149	.0050	.0020	--	--	--	--	5.9642	.0010	--	--
3284VA	16.05	85.4	899	9.6	5.0293	.0144	--	.0029	--	--	--	--	4.7893	.0048	.0014	--
3284VB	16.05	84.5	893	10.1	5.3753	.0202	--	.0051	.0040	--	--	--	5.0607	.0030	.0010	--
3284VC	16.05	86.8	897	10.0	3.2060	.0200	--	.0150	--	--	--	.0002	3.0000	.0020	--	.0005
3284YA	16.06	85.9	864	13.5	.6433	.0270	--	.0040	--	--	--	--	.2695	.0020	--	--
3284YB	16.06	88.0	888	11.1	.8778	.0316	--	.0008	--	--	--	--	.4747	.0016	--	--
3228A	17.01	82.3	844	15.2	2.5308	.0304	--	.0304	.0051	--	--	.0071	2.0284	.0101	--	--
3228B	17.01	89.1	896	10.4	.5406	.0156	--	.0311	--	--	--	.0010	.2075	--	.0052	--
3228C	17.01	85.8	861	13.9	.2970	.0139	--	.0009	--	--	--	--	.1852	--	.0009	--
3075A	18.01	86.2	867	13.2	.5920	.0049	--	.0098	.0049	--	.0002	--	.0977	.0029	.0020	--
3075B	18.01	85.8	869	12.9	1.2954	.0072	--	.0021	--	--	--	--	.1546	.0021	.0015	--
3076A	18.02	92.4	929	7.1	.4948	.0103	--	.0005	--	--	--	--	.1029	.0015	.0031	--
3076B	18.02	85.1	889	10.6	4.2699	.0152	.0505	.0015	--	--	.0005	--	.5051	.0071	.0071	--
3073A	18.03	89.7	902	9.8	.5163	.0098	--	.0007	--	--	--	--	.1465	.0020	--	--
3073B	18.03	89.3	897	10.3	.4422	.0098	--	.0029	--	--	--	--	.0977	.0010	--	--
3077A	18.04	91.9	930	6.9	1.2226	.0200	--	.0020	--	--	--	--	.1500	.0020	.0010	--
3077B	18.04	91.6	922	7.8	.6789	.0204	--	.0020	--	--	--	--	.1022	.0015	.0015	--
3074A	18.05	90.2	905	9.5	.3223	.0307	--	.0015	--	--	--	--	.0204	.0010	--	--
3074B	18.05	89.2	900	9.9	.8663	.0099	--	.1984	--	.0050	--	--	.0694	.0010	--	--
3078A	18.06	88.9	892	10.8	.3166	.0134	--	.0009	--	--	--	--	.1344	--	--	--
3079A	18.07	89.7	902	9.8	.5679	.0146	--	.0010	--	--	--	--	.0977	.0020	--	--
3079B	18.07	90.7	912	8.8	.4794	.0200	--	.0002	--	--	--	--	.1500	.0007	--	--
3283A	19.01	84.5	849	15.0	.5360	.0500	--	.0010	--	--	--	--	.1000	--	--	--
3283B	19.01	89.7	902	9.8	.5520	.0293	--	.0010	.0068	--	--	.0003	.0977	.0049	.0015	--
3283C	19.01	89.6	900	10.0	.3701	.0200	--	.0007	--	--	--	.0002	.1000	--	--	--
3283D	19.01	89.0	893	10.6	.3827	.0074	--	.0011	--	--	--	--	.1596	--	--	--
3283AA	19.02	77.1	780	21.7	1.1837	.0543	--	.0011	--	--	--	--	.7609	--	--	--
3283AB	19.02	90.0	904	9.6	.4557	.0191	--	.0005	--	--	--	--	.0956	--	--	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	B
3227YB	13.06	--	--	--	--	.0003	--	--	--	.0017	--	--	--	--	.0004
3227YC	13.06	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0002
3069B	14.01	--	--	--	--	--	--	.0011	--	.0005	--	--	--	--	--
3069C	14.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3069D	14.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3069F	14.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3165A	15.01	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3165B	15.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0002
3165C	15.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0001
3165D	15.01	--	--	--	--	.0007	--	--	--	--	--	--	--	--	.0002
3165E	15.01	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3165XA	15.02	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3165XB	15.02	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3165XC	15.02	--	--	--	--	.0004	--	--	--	--	--	--	--	--	.0001
3284	16.01	--	--	--	--	.0005	--	--	--	.0014	--	--	--	--	--
3284CA	16.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3284CB	16.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3284FA	16.03	--	--	--	--	.0015	--	--	--	.0015	--	--	--	--	--
3284FB	16.03	--	--	--	--	.0010	--	--	--	.0102	--	--	--	--	--
3284FC	16.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3284MA	16.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3284MB	16.04	--	--	--	--	.0006	--	--	--	.0009	--	--	--	--	--
3284MC	16.04	--	--	--	--	.0010	--	--	--	.0015	--	--	--	--	--
3284VA	16.05	--	--	--	--	.0004	--	--	--	--	--	--	--	--	--
3284VB	16.05	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3284VC	16.05	--	--	--	--	.0020	--	--	--	--	--	--	--	--	--
3284YA	16.06	--	--	--	--	.0007	--	--	--	--	--	--	--	--	--
3284YB	16.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3228A	17.01	--	--	--	--	.0005	--	--	--	.0009	--	--	--	--	--
3228B	17.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0001
3228C	17.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3075A	18.01	--	--	--	--	.0020	--	--	--	--	--	--	--	--	.0010
3075B	18.01	--	--	--	--	.0021	--	--	.0010	.2062	--	--	--	--	.0021
3076A	18.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0004
3076B	18.02	--	--	--	--	.0051	--	--	.0020	--	--	--	--	--	.0020
3073A	18.03	--	--	--	--	.0010	--	--	--	.0020	--	--	--	--	--
3073B	18.03	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3077A	18.04	--	--	--	--	.0015	--	--	.0010	.0005	--	--	--	--	.0015
3077B	18.04	--	--	--	--	.0010	--	.0005	--	--	--	--	--	--	.0010
3074A	18.05	--	--	--	--	.0010	--	--	--	--	--	--	--	--	--
3074B	18.05	--	--	--	--	.0015	--	--	--	--	--	--	--	--	--
3078A	18.06	--	--	--	--	--	--	--	--	--	--	.0018	--	--	--
3079A	18.07	--	--	--	--	.0005	--	--	--	--	--	--	--	--	.0015
3079B	18.07	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3283A	19.01	--	--	--	--	.0020	--	--	--	--	--	--	--	--	--
3283B	19.01	--	--	--	--	.0068	--	--	--	--	--	--	--	--	--
3283C	19.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--
3283D	19.01	--	--	--	--	.0011	--	--	--	--	--	--	--	--	--
3283AA	19.02	--	--	--	--	.0008	--	--	--	--	--	--	--	--	--
3283AB	19.02	--	--	--	--	.0005	--	--	--	--	--	--	--	--	--

Tolovana Data--Continued

Sample	Site	Be	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3227YB	13.06	--	--	.0003	.0173	.0087	.0017	.0009	.1730	5.78	6.7	4,991	750	385
3227YC	13.06	--	--	.0003	.0207	.0103	.0021	.0015	.1550	4.84	12.8	2,986	233	413
3069B	14.01	--	--	.0001	.0215	.0075	.0021	.0215	.7511	4.66	5.4	15,569	2,900	1,001
3069C	14.01	--	--	.0001	.0200	.0050	.0020	.0100	.2000	5.00	5.6	16,931	3,000	1,129
3069D	14.01	--	--	.0016	.2101	.0210	.0105	.0021	.5252	4.76	7.6	8,339	1,100	722
3069E	14.01	--	--	.0005	.0504	.0101	.0050	.0050	.3024	4.96	5.6	16,734	3,000	1,107
3165A	15.01	--	--	.0003	.0196	.0147	.0049	.0008	.1961	5.10	9.2	3,052	333	311
3165B	15.01	--	--	.0002	.0200	.0200	.0050	.0009	.2000	5.00	9.0	4,477	500	448
3165C	15.01	--	--	.0003	.0195	.0146	.0049	--	.1465	5.12	9.2	3,056	333	313
3165D	15.01	--	--	.0005	.0211	.0158	.0032	.0032	.1053	4.75	8.5	5,643	667	536
3165F	15.01	--	--	.0001	.0100	.0100	.0030	.0015	.1000	5.00	9.0	4,483	500	448
3165XA	15.02	--	--	.0002	.0133	.0088	.0044	.0009	.0442	5.66	10.3	5,145	500	582
3165XB	15.02	--	--	.0003	.0211	.0159	.0053	.0009	.2114	4.73	8.4	4,207	500	398
3165XC	15.02	--	--	--	.0073	.0010	.0021	--	.0313	4.80	8.6	5,716	667	549
3284	16.01	--	--	.0019	.9259	.0278	.0139	.0019	1.3889	5.40	13.3	4,639	350	716
3284CA	16.02	--	--	.0003	.0376	.0094	.0094	.0019	.1880	2.66	9.2	4,594	500	489
3284CB	16.02	--	--	.0008	.1167	.0167	.0117	.0033	.2500	3.00	17.7	5,314	300	1,063
3284FA	16.03	--	--	.0020	.2000	.0300	.0150	.0030	2.0000	5.00	8.6	8,572	1,000	857
3284FB	16.03	--	--	.0015	.2037	.0204	.0071	.0071	.5092	4.91	12.8	4,495	350	631
3284FC	16.03	--	--	.0006	.0647	.0139	.0046	.0014	.1848	5.41	14.4	6,706	467	1,037
3284MA	16.04	--	--	.0003	.0500	.0100	.0050	.0015	.2000	5.00	12.8	4,486	350	641
3284MB	16.04	--	--	.0009	.1792	.0134	.0090	.0009	.1792	5.58	9.6	1,371	143	153
3284MC	16.04	--	--	.0007	.0298	.0099	.0070	.0099	.1988	5.03	8.4	5,621	667	565
3284VA	16.05	--	--	.0007	.0479	.0144	.0048	.0048	.1437	5.22	8.9	5,943	667	620
3284VB	16.05	.0001	--	.0007	.0506	.0101	.0152	.0015	.2024	4.94	8.3	4,174	500	412
3284VC	16.05	--	--	.0005	.0500	.0100	.0050	.0009	.1000	5.00	8.7	4,340	500	434
3284YA	16.06	--	--	.0004	.0404	.0202	.0067	.0027	.2695	3.71	6.4	3,186	500	236
3284YB	16.06	--	--	.0005	.0316	.0158	.0032	.0016	.3165	3.16	7.9	2,782	350	251
3228A	17.01	--	--	.0020	.2028	.0507	.0051	.0051	.1521	4.93	5.4	2,703	500	178
3228B	17.01	--	--	.0007	.0519	.0156	.0031	.0009	.2075	4.82	8.6	5,725	667	552
3228C	17.01	--	--	.0003	.0185	.0093	.0028	--	.0648	5.40	6.2	6,179	1,000	445
3075A	18.01	--	--	.0010	.1465	.0195	.0068	--	.2930	5.12	6.5	17,659	2,700	1,339
3075B	18.01	--	--	.0021	.3093	.0722	.0103	.0072	.5155	4.85	6.7	11,892	1,786	923
3076A	18.02	--	--	.0010	.1543	.0072	.0051	.0021	.2058	4.86	13.0	8,982	690	1,265
3076B	18.02	.0002	--	.0101	3.0303	.0707	.0505	.0071	.5051	4.95	8.0	5,618	700	530
3073A	18.03	--	--	.0010	.1953	.0049	.0068	--	.1465	5.12	9.2	9,187	1,000	941
3073B	18.03	--	--	.0003	.0293	.0049	.0029	--	.2930	5.12	8.7	9,145	1,050	892
3077A	18.04	.0001	--	.0030	.5000	.0200	.0150	.0050	.5000	5.00	13.3	4,594	345	666
3077B	18.04	--	--	.0015	.2045	.0204	.0102	.0051	.3067	4.89	11.8	4,477	380	576
3074A	18.05	--	--	.0007	.0511	.0072	.0031	.0010	.2045	4.89	9.5	2,939	310	309
3074B	18.05	--	--	.0007	.0694	.0099	.0030	.0020	.4960	5.04	9.0	8,993	1,000	906
3078A	18.06	--	--	.0004	.0269	.0018	.0018	.0008	.1344	5.58	8.3	6,616	800	615
3079A	18.07	--	--	.0015	.1465	.0049	.0029	.0020	.2930	5.12	9.2	6,121	667	627
3079B	18.07	--	--	.0010	.1000	.0050	.0020	--	.2000	5.00	10.3	4,536	440	515
3283A	19.01	--	--	.0020	.1500	.0150	.0150	.0010	.2000	5.00	5.6	1,689	300	113
3283B	19.01	--	--	.0015	.0684	.0146	.0195	.0068	.2930	5.12	9.2	3,061	333	313
3283C	19.01	--	--	.0007	.0300	.0100	.0050	.0030	.2000	5.00	9.0	4,481	500	448
3283D	19.01	--	--	.0007	.0213	.0106	.0160	.0053	.1596	4.70	8.4	11,949	1,429	1,123
3283AA	19.02	--	--	.0003	.0217	.0109	.0076	--	.3261	4.60	3.5	1,418	400	65
3283AB	19.02	--	--	.0007	.0287	.0143	.0096	--	.2868	5.23	9.4	4,706	500	492

Tolovana Data--Continued

Sample	Site	% Au	Fine	Ag	Sum X	Cu	Zn	Pb	As	Sb	Cd	Bi	Hg	Ni	Co	Sn
3283V	19.03	89.5	898	10.2	.3861	.0102	--	.0007	--	--	--	--	.1016	--	--	--
3095A	20.01	87.2	885	11.4	1.4118	.0682	--	.0045	.0114	.0045	--	--	.4545	.0045	--	--
3155A	21.01	86.1	881	11.7	2.2325	.0333	--	.0017	--	--	--	--	.8333	.0050	--	--
3155B	21.01	90.9	927	7.2	1.9045	.0718	--	.0014	--	--	--	--	.0718	.0014	--	--
3155C	21.01	90.0	921	7.8	2.2531	.0466	--	.0311	--	--	--	--	.1553	.0016	--	--

Tolovana Data--Continued

Sample	Site	Mo	Ge	Pt	Pd	Ba	Sr	Zr	V	Cr	Y	La	Sc	Nb	B
3283V	19.03	--	--	--	--	.0015	--	--	--	--	--	--	--	--	--
3095A	20.01	--	--	--	--	--	--	--	--	.0019	--	--	--	--	--
3155A	21.01	--	--	--	--	.0008	--	--	--	.0033	--	--	--	--	--
3155B	21.01	.0007	--	--	--	.0029	--	--	--	.0718	--	--	--	--	--
3155C	21.01	--	--	--	--	.0311	--	--	--	.1553	--	--	--	--	--

Tolovana Data--Continued

Sample	Site	Be	W	Mn	Fe	Mg	Ca	Ti	Si	Wt	Au/Ag	Au/Cu	Ag/Cu	r/Cu
3283V	19.03	--	--	.0007	.0305	.0152	.0203	.0020	.2033	4.92	8.8	8,802	1,000	866
3095A	20.01	--	--	.0114	.6818	.0034	.0045	.0019	.1591	2.20	7.7	1,279	167	113
3155A	21.01	--	--	.0050	.3333	.1667	.0083	.0083	.8333	3.00	7.4	2,583	350	221
3155B	21.01	--	--	.0287	1.4368	.1006	.0431	.0014	.0718	3.48	12.7	1,265	100	176
3155C	21.01	--	--	.0155	.7764	.0776	.0776	.1087	.7764	3.22	11.6	1,932	167	249

TABLE 5.--Spectrographic analyses for the nonmagnetic fraction of the heavy-mineral-concentrate samples from lode and placer gold samples from the Tolovana mining district, Livengood quadrangle, Alaska

[N, not detected; <, detected but below limit of determination shown; >, determined to be greater than value shown; values in parts per million except where noted; %, percent. No concentrate samples collected at sites 8, 9, 14, 15, and 18. See table 1 for locality name.]

Sample	Site	S-Fe %	S-Mg %	S-Ca %	S-Ti %	S-Mn	S-Ag	S-As	S-Au	S-B	S-Ba	S-Be	S-Bi	S-Co	S-Cr
3225	A	2.0	.10	.10	.70	70	200.0	2,000	1,000	150	5,000	20	N	N	150
3225A	A	10.0	.10	.15	.20	700	N	7,000	N	50	500	7	N	50	300
3231	1	20.0	.05	.20	.10	150	100.0	700	500	N	1,000	N	N	30	500
3224	2	.5	<.05	<.10	.30	70	200.0	N	50	N	50	N	N	N	1,000
3224A	2	.2	<.05	<.10	.20	30	300.0	N	>1,000	N	50	N	N	N	1,000
3286	2	2.0	.05	.20	1.50	30	100.0	1,500	100	20	1,000	N	20	N	1,500
3221	3	10.0	.15	.30	1.00	200	70.0	70,000	700	20	3,000	3	<20	70	2,000
3222	3	10.0	.30	.50	>2.00	700	15.0	10,000	100	100	1,500	5	N	70	1,500
3217	4	10.0	.15	.70	.70	200	70.0	>20,000	500	<20	5,000	N	50	70	10,000
3219	5	15.0	.10	.20	.20	100	20.0	>20,000	70	N	1,500	N	30	100	1,500
3220	5	10.0	1.50	.30	1.50	1,000	50.0	20,000	500	100	5,000	3	N	70	3,000
3285	6	7.0	.10	.10	>2.00	20	150.0	1,000	1,000	200	7,000	10	N	15	70
3216	7	7.0	2.00	.50	2.00	1,000	1.5	2,000	N	50	3,000	3	N	50	5,000
3289	7	7.0	.05	5.00	>2.00	30	100.0	>20,000	1,000	20	7,000	N	<20	30	N
3072	10	20.0	.10	1.00	.50	70	200.0	700	>1,000	N	>10,000	N	N	50	N
3229	11	10.0	1.00	1.00	.70	700	20.0	5,000	100	20	>10,000	N	20	100	10,000
3226	12	.1	<.05	<.10	.01	50	>10,000.0	700	>1,000	N	<50	N	N	N	200
3227	13	10.0	.30	.70	1.00	700	200.0	N	>1,000	50	100	N	N	20	200
3227A	13	7.0	.05	.15	.05	500	5.0	700	50	20	150	5	N	10	N
3284	16	2.0	.30	10.00	>2.00	200	70.0	1,000	>1,000	30	10,000	<2	50	N	2,000
3228	17	10.0	1.00	2.00	1.00	1,000	1.0	1,000	N	20	10,000	N	N	100	2,000
3283	19	5.0	.15	.50	>2.00	300	1,000.0	3,000	>1,000	50	>10,000	7	N	10	300
3095	20	10.0	.70	1.50	2.00	1,000	1.0	1,500	N	30	>10,000	N	N	70	10,000
3155	21	5.0	.70	1.50	>2.00	1,000	2.0	N	N	200	>10,000	N	N	70	>10,000

TOLOVANA C3 DATA--Continued

Sample	Site	S-Cu	S-La	S-Mo	S-Nb	S-Ni	S-Pb	S-Sb	S-Sc	S-Sn	S-Sr	S-V	S-W	S-Y	S-Zn	S-Zr
3225	A	10	200	N	N	10	N	N	10	N	5,000	300	150	30	N	500
3225A	A	100	50	N	N	150	30	20,000	20	N	200	150	N	50	700	300
3231	1	50	300	N	N	100	2,000	N	10	>2,000	N	30	200	20	N	100
3224	2	70	1,000	N	N	50	20	N	N	N	N	20	N	50	N	2,000
3224A	2	50	1,000	N	N	50	30	N	N	N	N	20	N	50	N	2,000
3226	2	300	100	N	70	50	10,000	200	--	1,000	500	50	20,000	100	N	>2,000
3221	3	70	1,500	N	<50	100	1,500	500	N	N	500	70	300	100	500	500
3222	3	100	1,000	10	50	200	300	N	15	N	500	200	200	150	700	1,000
3217	4	1,000	500	N	N	150	20,000	2,000	10	>2,000	700	70	5,000	150	1,000	1,000
3219	5	50	N	N	N	150	1,000	2,000	N	50	N	50	1,000	30	500	700
3220	5	100	200	15	70	300	700	1,000	15	N	700	100	150	100	1,000	500
3285	6	50	70	N	500	20	150	<200	N	500	2,000	200	700	200	1,000	1,000
3216	7	100	1,000	10	50	200	200	500	20	20	500	200	200	150	500	700
3289	7	300	150	N	70	70	5,000	<200	N	700	2,000	30	>20,000	300	N	2,000
3072	10	70	N	N	N	150	1,000	N	N	>2,000	200	N	1,000	50	N	2,000
3229	11	200	300	N	N	300	1,500	N	15	300	200	200	700	70	500	700
3226	12	150	N	N	N	30	300	N	N	N	N	N	200	N	N	200
3227	13	50	100	N	N	50	30	N	30	N	200	200	300	70	N	700
3227A	13	300	N	20	N	50	N	N	N	N	N	200	N	50	N	50
3284	16	50	200	N	50	50	7,000	700	--	1,500	1,000	200	2,000	300	N	>2,000
3228	17	200	200	N	N	100	2,000	N	30	N	500	200	200	100	500	700
3283	19	20	700	N	150	20	20	<200	--	2,000	500	300	500	500	N	>2,000
3095	20	150	300	N	N	200	200	N	15	N	200	200	100	100	500	2,000
3155	21	70	1,000	N	50	150	100	N	10	100	200	300	N	150	N	>2,000

TABLE 6.--**Mineralogy of the nonmagnetic fraction of the heavy-mineral-concentrate samples from lode and placer gold samples from the Tolovana mining district, Livengood quadrangle, Alaska**

[Arsenopyrite, FeAsS; barite, $BaSO_4$; cassiterite, SnO_2; cerussite, $PbCO_3$; cinnabar, HgS; galena, PbS; gold, Au; pyrite, FeS_2; scheelite, $CaWO_4$; sphalerite, Zn(Fe)S; and stibnite, Sb_2S_3. No mineralogy for sites 8, 9, 14, 15, and 18. X, present; 70, estimated percentage (%). See table 1 for locality name.]

Site number	Gold	Arsenopyrite	Galena	Stibnite	Cerussite	Sphalerite	Cinnabar	Pyrite	Scheelite	Barite	Cassiterite
A	X			X			X				
1	X						X	90	X		
2	X	X					70	X	X		
3	X	X					X	70	X	X	
4	X	X			X		X	60	20		
5	X	X					X	30	X		
6	X					X	X				X
7	X	25	X	X			10	10	30	10	X
10	X		X				X	X	X	X	
11	X	X					X	50	X		
12	X	70					X		X		
13	X						X		X		
16	X				X		10	30	5	20	X
17	X							X	X		
19	X	X						X	X	20	X
20	X							30	X		
21	X						X	X			